



Anglia Level Crossing Reduction Strategy

Ecology Constraints Report: Suffolk

April 2017

Mott MacDonald
22 Station Road
Suffolk CB1 2JD
United Kingdom

T +44 (0)1223 463500
F +44 (0)1223 461007
mottmac.com

Anglia Level Crossing Reduction Strategy

Ecology Constraints Report: Suffolk

April 2017

Issue and revision record

Revision	Date	Originator	Checker	Approver	Description
A	February 2017	Beth Ellis/ Reena Bhavsar	Ric Sandifer	Laura Henderson	Draft for client comment
B	April 2017	Beth Ellis	Ric Sandifer	Laura Henderson	Final

Document reference: 367516 | RPT191 | B

Information class: Standard

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Contents

Executive summary	1
1 Introduction	2
1.1 Aims and Objectives	4
1.2 The Zone of Influence	4
1.3 Legislative Context and Policy Framework	5
2 Methodology	6
2.1 Desk Study	6
2.2 Field Surveys	6
2.3 Bat Inspection Survey	6
3 Ecological Impact Summaries	9
3.1 Crossing: S01 Sea Wall	13
3.2 Crossing: S02 Brantham High Bridge	14
3.3 Crossing: S03 Buxton Wood	15
3.4 Crossing: S04 Island	16
3.5 Crossing: S05 Pannington Hall	17
3.6 Crossing: S07 Broomfield	18
3.7 Crossing: S08 Stacpool	19
3.8 Crossing: S13 Fords Green	20
3.9 Crossing: S16 Gislingham	21
3.10 Crossing: S17 Paynes	22
3.11 Crossing: S24 Higham Ground Frame	23
3.12 Crossing: S25 Cattishall	24
3.13 Crossing: S27 Barrels	25
3.14 Crossing: S28 Grove Farm	26
3.15 Crossing: S29 Hawk End Lane	27
3.16 Crossing: S30 Lords No29	28
3.17 Crossing: S31 Mutton Hall	29
3.18 Crossing: S69 Bacton	30
4 Additional Survey Requirements	31
5 Biodiversity Enhancements	33
6 References	34
A. Species Specific Legislation	36

A.1	Birds	36
A.2	Bats	36
A.3	Badgers	36
A.4	Reptiles	36
A.5	Great Crested Newts and other Amphibians	36
A.6	Other Mammals	36
A.7	White-clawed Crayfish	37
A.8	Invasive, non-native species	37

Executive summary

Mott MacDonald was commissioned by Network Rail to undertake an ecological appraisal in connection with the proposed closure of, and/or changes to rights at 24 level crossings on railway lines within the county of Suffolk. Collectively, these level crossing closures or changes will be contained in the draft Suffolk Level Crossing Reduction Order which is part of the wider Anglia Level Crossing Reduction Strategy. The assessment of ecological constraints has been undertaken regarding current good practice and forms part of the technical information commissioned by Network Rail in connection with the Reduction Strategy.

At S01 the proposed footprint is located adjacent to the boundary of the Stour and Orwell Estuary Special Protection Area (SPA) European site, and the Stour and Orwell Estuary Ramsar wetland of international importance. Report 367516/RPT192 (Mott MacDonald, 2017a) provides a Habitats Regulations Assessment (HRA) Task 1 Screening for the proposal and provides information to enable screening of the proposed route option at S01 Sea Wall with respect to the determination of a likely significant effect (LSE) on European sites of nature conservation importance. This Task 1 Screening report identified that no likely significant effect alone or in combination is expected during the construction and operational phase of the new footpath and as such, this assessment does not require further assessment on site integrity.

The proposed route of new sections of footpath will cross through non-statutory designated sites (County Wildlife Sites; CWS) at S04, S07, S08, S12, S17, S21 and S31. CWSs also lie immediately adjacent to S02, S03, S05. Access to each CWS would be unchanged and the small scale, localised nature of the works has no implications for loss of habitat or disturbance. Indirect impacts potentially arising from works adjacent to a watercourse would be controlled by the application of best practice guidance and Network Rail standards. It is considered that there is no potential loss of integrity at any of the CWS. However, consultation with the Suffolk County Ecologist is ongoing.

Overall it is predicted that adverse impacts on priority habitats and protected species resulting from the proposals are unlikely on condition that methods of best practice are applied during vegetation clearance and installation works associated with new footbridges and step access.

Further surveys (preconstruction) are required where access for field surveys was unavailable and where initial surveys have identified the potential for protected species and further information is required to inform mitigation and licencing requirements.

1 Introduction

Mott MacDonald was commissioned by Network Rail to undertake an ecological appraisal to inform the proposed closure of, and/or changes to rights at 24 level crossings on railway lines within the county of Suffolk. Collectively, these level crossing closures or changes will be contained in the draft Suffolk Level Crossing Reduction Order which is part of the wider Anglia Level Crossing Reduction Strategy (herein known as the Suffolk Order).

The ecological appraisal has been undertaken with reference to current good practice and forms part of the technical information commissioned by Network Rail in connection with the scheme. Initially, a screening exercise was undertaken to identify which level crossings required an ecological appraisal based on:

- The category of works; and
- A desk top review of potential ecological constraints.

The works categories are outlined below as defined in the Stakeholder Engagement Plan (367516/RPT01C):

- Category 1 – Closure of historic Public Rights of Ways that currently have no physical infrastructure to allow crossing of the railway;
- Category 2 – Closure of (mostly private) level crossings with no works required outside of the Network Rail boundary and no Public Rights of Way in the vicinity to be affected;
- Category 3 – Closure of level crossings and extinguishment of the Public Rights of Way (outside of the Network Rail boundary) where there is an existing alternative means of crossing the railway in the vicinity (e.g. an existing Public Right of Way on a parallel route);
- Category 4 – Closure of level crossings and extinguishment of the Public Right of Way (outside of the Network Rail boundary) and a diversion to new or enhanced infrastructure (such as new footpaths, steps, bridleways, circular routes etc.) at an alternative railway crossing point nearby;
- Category 5 – Closure of level crossings with works required outside of the Network Rail boundary (e.g. changes to signage) but without affecting other Public Rights of Way in the vicinity of the crossing;
- Category 6 – Downgrade or change of use involving extinguishment of public vehicular rights (except for specified private users where applicable) whilst keeping the crossing open for non-motorised users (e.g. conversion to bridleway or footpath); and
- Category 7 - Proposals that will facilitate grade-separated access from each side of the railway as part of another Network Rail Scheme.

Crossings were screened in where the proposed works would result in potential direct or indirect impacts on adjacent habitats.

Installation of fencing within Network Rail land is required at the majority of level crossings to prevent trespass onto the railway. Whilst these works would result in habitat loss, they will be localised and small scale and potential risk will be managed through the contractor's obligation to comply with Network Rail's Contract Requirements-Environment (CR-E). Compliance with relevant sections of the CR-E will be demonstrated through the contractor's Construction Environment Management Plan (CEMP) that will be agreed with Network Rail before physical works can begin. The production of a CEMP in advance of physical works is mandatory on Network Rail schemes and this legal requirement appropriately manages construction risk.

The results of the screening exercise are outlined in Table 1 below.

Table 1: Ecology Scoping Results: Suffolk

Level crossing	Category of works	Requirement for Ecological Appraisal
S01	4	Yes
S02	4	Yes
S03	3	Yes
S04	3	Yes
S05	4	Yes
S07	4	Yes
S08	3	Yes
S11	3	No: Works restricted to installation of fencing within Network Rail land
S12	3	No: Works restricted to installation of fencing within Network Rail land
S13	3	Yes
S16	3	Yes
S17	3	Yes
S18	3	No – survey not required due to no physical works being undertaken. The proposal is to formalise the existing position at the level crossing by means of downgrade.
S21	2	No: Works restricted to installation of fencing within Network Rail land
S22	3	No: Works restricted to installation of fencing within Network Rail land
S23	4	No: Works restricted to installation of fencing within Network Rail land
S24	4	Yes
S25	4	Yes
S27	4	Yes
S28	4	Yes
S29	4	Yes
S30	3	Yes
S31	4	Yes
S69	4	Yes

Source: Mott MacDonald

A figure showing the locations of the 24 level crossings within Suffolk is shown in Appendix A of the Anglia Level Crossing Reduction Strategy, Environmental Appraisal and Action Plan, 367516/RPT190 Revision A (Mott MacDonald, January 2017b).

Since ecology works began to inform the Suffolk Order in early 2016 there have been a series of design changes, including the removal of some level crossings. Full details of the design changes can be found in Appendix B of the Environmental Appraisal and Action Plan report.

This report supports the Environmental Appraisal and Action Plan and provides full details of the ecology surveys completed at the 18 level crossings scoped in for an ecological appraisal.

The proposed footprint at S01 is located adjacent to the boundary of the Stour and Orwell Estuary Special Protection Area (SPA) European site, and the Stour and Orwell Estuary Ramsar wetland of international importance. A Habitats Regulations Assessment (HRA) Task 1 Screening has been carried out for this level crossing (Mott MacDonald, January 2017a). The screening exercise identified a number of potential impacts on qualifying features of the Sour and Orwell Estuaries SPA/Ramsar. These included: noise disturbance, accidental pollution of water and disturbance associated with artificial lighting during construction; and disturbance from human presence, both during construction and operation. In all cases, the potential

impacts identified relate to bird features (waterfowl assemblage) of the site, with no potential impact pathways identified for other features.

No Likely Significant Effect (LSE) has been identified to any SPA feature on the understanding that construction works, such as removal of level crossing infrastructure and fence installation, would not be undertaken between September – March inclusive (the winter period for waterbirds) or within 300m of mean high water springs (MHWS). Industry best practice would be adhered to as set out in the CIRIA Control of water pollution from construction sites guidance (C532) and 'BS 5228-1:2009: Code of practice for noise and vibration control on construction and open sites' to minimise the likelihood of water pollution or noise disturbance events occurring. Acoustic barriers and screening bund are to be used where practicable. Full details of this assessment are presented within the HRA screening report and are not considered further within this report.

1.1 Aims and Objectives

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

The objectives are to:

- Identify any designated sites for nature conservation and/or habitats on, near and adjacent to the proposed new route;
- Identify any notable and/or protected plant or animal species of conservation importance, which may occur on or near the proposed new route;
- Identify the presence of any invasive plant species as listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) on or adjacent to the proposed new route;
- Provide a habitat map of ecological features as identified above;
- Undertake a preliminary assessment of the potential impacts on any ecological features of conservation importance identified on, near or adjacent to the proposed new route; and
- Recommend further surveys, mitigation and enhancement measures as appropriate.

1.2 The Zone of Influence

The current guidance on ecological assessments (CIEEM, 2016) recommends that all ecological features that occur within a 'zone of influence' (Zol) for a proposed development are investigated. The Zol includes:

- Areas directly within the land take for the proposed development and access;
- Areas which will be temporarily affected during construction;
- Areas likely to be impacted by hydrological disruption; and
- Areas where there is a risk of pollution and noise disturbance during construction and/or operation.

The Zol is variable depending on the ecological features affected. The Zol for this project is represented by:

- The footprint of the works and a 30m buffer for terrestrial habitats and species;
- A buffer of 250m from the works for amphibians;
- A river/watercourse section of 100m upstream and 100m downstream from the works area;

- A 500m buffer for non-statutory designated sites; and
- A buffer of 2km for designated sites.

1.3 Legislative Context and Policy Framework

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

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

Further legislation for each of the protected species groups can be found in Appendix A.

2 Methodology

2.1 Desk Study

A review of existing statutory designated sites, priority habitats, and protected and notable species records within 2km of the site has been undertaken. Information regarding local and national statutory sites for nature conservation was obtained from Multi-Agency Geographic Information for the Countryside (MAGIC, 2016a) and the Joint Nature Conservation Council (JNCC) websites (JNCC, 2017). This included a review of the MAGIC website detailing Natural England's Impact Risk Zones for Sites of Special Scientific Interest (MAGIC 2016b).

Details on the location of non-statutory sites for nature conservation and records of protected and notable species within 500m of the site were obtained from Suffolk Biodiversity Information Service (BIS). Details on the Local Biodiversity Action Plan (LBAP) species and habitats for Suffolk were found online (Suffolk Biodiversity Partnership, 2012).

A search of waterbodies within 250m of the site was conducted using OS mapping.

2.2 Field Surveys

Field surveys were undertaken by experienced Mott MacDonald ecologists in April, May, September, December 2016 and January 2017 and followed BS 42020:2013 'Biodiversity. Code of practice for planning and development' (BSI, 2013) and 'Guidelines for Preliminary Ecological Appraisal' (CIEEM, 2013). The surveys were conducted primarily from public rights of way and where access was obtained along the proposed route alignments.

Where access was not possible, surveys were either undertaken from vantage points or further surveys have been recommended. Broad habitat types were noted and any priority habitats (i.e. habitats of principal importance listed under Section 41 of the Natural Environment and Rural Communities Act, 2006) were noted, as were any protected or notable species. Additionally, the presence of any invasive species listed on under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was recorded.

An assessment was also undertaken of the likely presence or absence of protected and notable animal species within the ZOI of the proposed development. This was based on the known distribution of species, habitat suitability and/or direct evidence such as field signs or observations.

2.3 Bat Inspection Survey

To inform proposals at S25 and S31, ground level assessments of trees within the land boundary of the proposed route were undertaken in 2016.

The surveys were undertaken in accordance with the Bat Conservation Trust (BCT) Good Practice Guidelines (Collins, 2016) and British Standard 8596:2015 'Surveying for bats in trees and woodland guidelines' (BSI, 2014). A detailed inspection of the exterior of each tree from ground level, using binoculars and torches was undertaken to search for potential (bat) roost features (PRF). The results were used to determine further survey effort (including number of surveyors and survey locations), if required.

Each tree surveyed was categorised for its roost potential in accordance with BCT guidance as detailed in Table 2 below.

Table 2: Categories of tree roost assessment

Bat Roost Potential	Description
Negligible	A tree which is considered to have no features of importance for roosting bats.
Low	A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only limited roosting potential.
Moderate	A tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
High	A tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Confirmed	Bats or evidence of bats recorded within the tree, including both current and/or historic roosts.

Source: Collins, 2016

2.4 Assessment of Conservation Importance

The conservation importance of each of the main ecological features (designated sites, habitats and plant species) that occur within the Zol was assessed. All ecological features identified were assessed using the following frame of reference: International and European, National, Regional, County, Local (CIEEM, 2016).

The criteria which are used in the assessment of conservation importance include, but are not limited to: designation of the site; rarity of the species or habitats; presence of Red Data Book (RDB) or endemic species; presence of diverse plant communities; plant communities typical of natural/semi-natural habitats; habitat diversity and connectivity; and presence of Section 41 habitats and species (CIEEM, 2016).

To determine the conservation importance of populations present within habitats along the proposed routes, species specific surveys may be required. Where it was considered that the likely impacts on protected species could be controlled and minimised through the application of precautionary methods during works, regardless of the conservation importance of populations present, no further species specific surveys are recommended.

2.5 Assessment of Likely Impacts

An initial assessment of the likelihood of adverse impacts as a result of proposed route alignment was undertaken using the scale of certain/near certain, probable, unlikely and extremely unlikely.

2.6 Study Limitations

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

Ecological surveys are limited by factors such as time of year of the survey which affect the ability to detect plants and animals. Optimal survey times vary between species and species groups therefore a single survey visit may overlook or under-record certain species. This report is therefore unlikely to present a full and complete assessment of the biodiversity of each crossing site because it is based on a single site visit. However, the surveys were completed within the optimal period for most species relevant to the assessment.

On occasions, access limitations were encountered during the field surveys. However, this was overcome by visual assessment (with binoculars where necessary) and a review of aerial imagery, thus did not significantly diminish the robustness of the surveys.

3 Ecological Impact Summaries

For ease of reference each crossing is independently presented within the Ecological Impact Summaries below. Each summary provides details of the desk study and field survey results, together with a map detailing habitats present along and within 30m of proposed new sections of footpath, where possible. Habitats included following recent design changes are not shown on the maps.

The maps are adapted from standard Phase 1 Habitat mapping techniques (JNCC, 2010) and use information gathered during field surveys or aerial imagery where access was prohibited.

A series of key recommendations are included where impacts are considered likely. These recommendations are as follows:

Table 3: Description of Key Ecological Recommendations (KER)

Recommendation	Feature	Description
A	Watercourse	<p>Watercourse: It is recommended that all works are undertaken with regard to the pollution prevention guidelines (PPGs) with particular reference to PPG1 (general guide to the prevention of water pollution), PPG5 (works near or liable to affect watercourses) and PPG6 (working at construction and demolition sites) and the Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites. Pollution Prevention Guidelines (PPGs) are a series of documents developed by the Environment Agency for England and Wales, Each PPG is targeted at a particular type of business or activity and covers environmental good practice to minimise pollution.</p> <p>Works would be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.</p>
B	Breeding Birds	<p>Methods of best practice are recommended where vegetation removal is required. Vegetation clearance should be undertaken outside the breeding season (i.e. October to February). Where vegetation clearance activities cannot be avoided during the breeding season, a check for breeding birds would be undertaken no more than 24 hours before vegetation clearance. If breeding birds are discovered, then works within a 10m buffer of the active nest would be postponed until the chicks have fledged and the nest is inactive. Works would also be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.</p>
C	Common reptile species	<p>Methods of best practice are recommended where vegetation clearance is required. If vegetation clearance is undertaken during the active reptile season (March to October), immediately prior to the works, all suitable habitats within the working area would be checked by an ecologist or environmental representative (having been advised by the ecologist). Any piles of wood, brash and rubble within the working area would be dismantled by hand and immediately removed to</p>

		<p>outside the working area. Where it is not essential to remove potential refuges in order to undertake the works, these would be left undisturbed. Once the hand search is complete the vegetation would be strimmed and/or cut using hand tools by the Contractor to approximately 150mm. Following the initial cut the area would be checked for the presence of reptiles before being cleared to ground level. If works need to take place during the hibernation period (October to March), an ecologist would be present to check the area for suitable hibernation sites. Should hibernating reptiles be recorded, they will be left undisturbed and their place of shelter returned to its original condition to minimise the risk of mortality at this time of year. Works would be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.</p>
D	Water vole	<p>Where potential impacts to water vole are considered possible, preconstruction water vole presence/absence surveys will be undertaken to inform detailed mitigation and licensing requirements. Surveys to follow best practice (Dean <i>et al</i>, 2016). Works would be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.</p>
E	Otter	<p>Further surveys are to be undertaken preconstruction to inform appropriate mitigation during construction where relevant. Surveys to follow best practice (Natural England, 2014). If a potential holt site is identified, the application of best practice would be undertaken and/or avoidance of impacts through appropriate timing of works. This would prevent any adverse impact to otter as a result of increased noise associated with the presence of machinery/increased human presence during construction.</p> <p>Where night works are required adjacent to habitat considered suitable for otter, directional lighting would be used to reduce light spill.</p> <p>Works would be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.</p>
F	Badger	<p>A precautionary approach shall be applied for the removal of areas of dense scrub and methods of best practice followed. Vegetation clearance would be undertaken in the presence of an ecologist using hand tools only. If evidence of a badger sett is found clearance works would stop. If any proposed route alignment is deemed to be too close to a badger sett or considered to cause a disturbance, best practice will be followed. Either the route would be adjusted within the limit of the Order so that it lies at a sufficient distance so as not to cause disturbance or appropriate mitigation would be agreed with Natural England through the licensing process.</p> <p>Works would be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.</p>
G	Great crested newt	<p>In the absence of detailed survey information, a precautionary approach would be adopted whereby it is</p>

		<p>assumed that great crested newts may be present in the potential foraging and/or commuting habitats identified. Works will be limited to above ground clearance only and no resurfacing along suitable habitat is proposed. Vegetation clearance will be minimal and will not result in any long-term loss of large areas of suitable habitat or result in permanent or temporary habitat fragmentation. Due to the small scale of the works it is considered unlikely that the works will result in an offence.</p> <p>Any vegetation clearance should be undertaken during the great crested newt active season (March to October). A tool box talk would be given to all contractors working within the area to ensure that they are aware of the potential presence of newts. All suitable habitats within the working area would be checked by the ecologist or an ecological representative for the presence of great crested newt, prior to works.</p> <p>Any piles of wood, brash and rubble within the working area would be dismantled by hand and immediately removed to outside the working area. Where it is not essential to remove potential refuges to undertake the works, these will be left undisturbed. Once the hand search is complete, the vegetation will be strimmed and/or cut by the Contractor to approximately 150mm.</p> <p>A further vegetation cut would be carried out with the presence of an ecologist/ ecological representative following the initial cut to reduce the vegetation to the required height. If works are occurring during the hibernation period for great crested newt (November to February), potential refuges are to be left undisturbed.</p> <p>In the unlikely event that a great crested newt is found all works would stop and ecological advice sought. The discovery of a newt may trigger the requirement for a licence from Natural England for which an application would be needed. Appropriate mitigation on how works should proceed to avoid impacts to this species would be agreed with Natural England as part of this process. Given that the works would be limited to areas of suitable terrestrial habitat only (no potential breeding ponds affected) and small scale and localised, it would be likely that licensable works would meet criteria for a low impact licence from Natural England.</p>
H	Hazel Dormouse	<p>An assessment of habitat suitability (optimal vs sub optimal) for this species is required. This assessment should be based on habitat connectivity, vegetation density and height and abundance of fruiting shrubs.</p> <p>Optimal habitats may require further survey to inform final mitigation ahead of construction. It should be noted that surveys may require nest tubes to remain in place for the entire season (between April and November) in accordance with Natural England guidance (Bright <i>et al</i>, 2006).</p> <p>In sub-optimal habitats a precautionary approach would be adopted for vegetation clearance. Works would require small-scale and localised ground disturbance. Vegetation clearance and stump removal would only occur following hand searches by a licensed ecologist.</p>
I	Cetti's warbler	<p>Where habitats have been identified with potential to support this Schedule 1 bird, additional survey would be required if vegetation clearance is needed during the</p>

		breeding season. Prior to vegetation clearance works a breeding bird survey would be required to identify and map Cetti's warbler territories to ensure no direct or indirect disturbance to breeding birds. Field methods would be based on the British Trust for Ornithology's Common Bird Census (Marchant, 1983) with the number of visits undertaken in accordance with Scottish Natural Heritage (2005 and 2014).
J	Rabbits	It is an offence to cause unnecessary suffering to a rabbit under the Wild Mammals (Protection) Act 1996. Advice must be sought from a pest controller on the appropriate removal of rabbits from within work areas

Source: Mott MacDonald, 2017

3.1 Crossing: S01 Sea Wall

Desk Study Results

- Statutory Designated Sites
Stour Estuary SSSI and Stour and Orwell Estuaries SPA and Ramsar is located directly adjacent to the proposed route. The estuary includes extensive mud-flats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The SSSI is 2252.57 ha and is in an overall favourable condition.
- Non-Statutory Designated Sites
None present within 500m of the scheme
- Waterbodies
There is a large fishing lake directly north of a section of the proposed route. The south eastern stretch of the route joins an existing footpath directly adjacent to the Stour estuary. Two watercourse crossings are included within the proposal. There are a number of pools within the swamp habitat (although only one is shown on the adjacent map).
- Species Records within 500m:
Starling *Sturnus vulgaris*; stag beetle *Lucanus cervus*; great tit *Parus major*; European hedgehog *Erinaceus europaeus*; house sparrow *Passer domesticus*; lesser calamint *Clinopodium calamintha*; *Chrysura radians*; blood-vein moth *Timandra comae*; large wainscot moth *Rhizedra lutos*a; rosy rustic moth *Hydraecia micacea*; common lizard *Zootoca vivipara*; slow-worm *Anguis fragilis*; grass snake *Natrix natrix*; European otter *Lutra lutra*; coal tit *Periparus ater*; robin *Erithacus rubecula*; linnet *Linaria cannabina*; brown hare *Lepus europaeus*; dunnoek *Prunella modularis*; wren *Troglodytes troglodytes*; curlew *Numenius arquata*; Canada goose *Branta canadensis*; black swan *Cygnus atratus*
Water dropwort *Oenanthe crocata*, Meadow pipit *Anthus pratensis*; brent goose *Branta bernicla*; herring gull *Larus argentatus*; little egret *Egretta garzetta*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable, scrub, scattered trees, unimproved neutral, improved grassland as well as poor semi-improved grassland along sea wall embankment, watercourses and swamp habitat with pools of standing water dominated by common reed. Railway embankments are typical of recently disturbed habitat and support mosaic of ephemeral/perennial species and bare ground with scattered scrub.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Priority Habitat: Reedbed habitat is listed under Section 41 of the NERC Act 2006. Reedbed habitat dominated by common reed present adjacent to works. Reedbed also present along margins of watercourse adjacent to the sea wall embankment.
- Bats: There is foraging/commuting potential along field margins and vegetated railway embankments.
- Badgers: No evidence found at the time of survey. Suitable habitat for badger sett creation within earth banks (railway embankments). Suitable foraging habitat along railway embankments and along field margins.
- Birds: There is potential for common species of breeding birds in reedbeds, trees and scrub along the new route option. The reedbed and adjacent scrub provide suitable habitat for Cetti's warbler, a Schedule 1 bird.
- Otters: No holt identified along the route of the proposed alignment. Existing dyke has potential to support commuting and forging otter.
- Reptiles: There is suitable habitat along field margins, disturbed ground, scrub and banks of existing sea wall.
- Water voles: Further surveys required in 2017 to assess habitat suitability at location of water course crossing.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	Results of HRA Task 1 Screening presented in report 367516/RPT192.	N/A
Priority Habitats	Likely	Approximately 4m of reed would be temporarily removed along the margins of a watercourse. Long term, the reeds would grow back to the footbridge with no significant loss of connectivity. At 3m wide the footbridge would not cause a significant amount of shading long the watercourse. The construction of the footbridge would be bank to bank with no disruption of water flow. By locating the crossing away from the main reed area this will minimise disturbance on protected/notable species that may be present.	A
Bats	Unlikely	Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	No badger field signs identified within Zol of the proposed works during the survey. No badgers have been previously recorded within 500m of the proposed route. Earth banks provide suitable habitat for sett creation and foraging however, similar habitats are widely present in the surrounding area and thus small loss of habitat will have a negligible impact.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats. Suitable habitat for Cetti's warbler.	B, I – Refer to Section 4
Dormice	N/A	No habitat suitability within the Zol of the scheme	N/A
Great crested newts	Extremely Unlikely	No habitat suitability within the lake due to the its large size, depth and presence of fish. No habitat suitability within standing water within the swamp.	N/A
Otters	Unlikely	No long-term loss of large areas of suitable otter habitat. No permanent or temporary habitat fragmentation. The dyke will not be obstructed during construction and otters could continue commuting along the watercourse, if present.	E
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	Unlikely	Water voles have been recorded within 500m of the proposed route. If present, the proposed works would have a low impact on this species. Any loss of foraging habitat will be temporary and the area very small in the context of the surrounding habitats. Works will not result in any long-term loss of large areas of suitable water vole habitat or result in permanent or temporary habitat fragmentation.	D – Refer to Section 4
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Evidence of rabbit found along route option. Suitable habitat for stag beetle adjacent to proposed new route..	J
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.2 Crossing: S02 Brantham High Bridge

Site location:
CO11 1PL

Grid Reference:
TM12104 34890

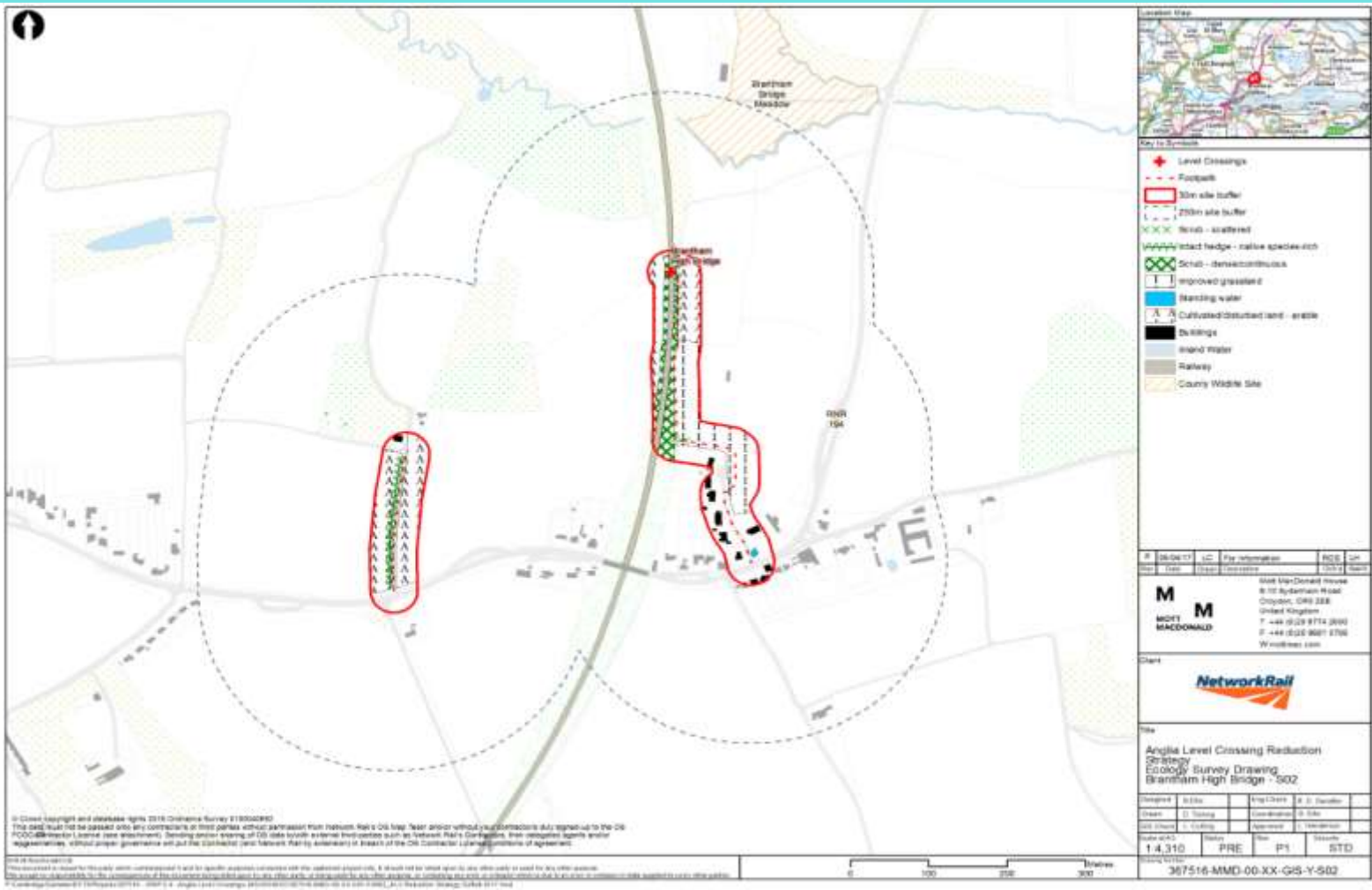
Survey Date:
13/04/2016 & 26/09/2016

Desk Study Results

- Statutory Designated Sites
Stour Estuary SSSI and Stour and Orwell Estuaries SPA and Ramsar is located 1.1km south of the proposed route (not shown on map). The estuary includes extensive mud-flats, low cliffs, saltmarsh and small areas of vegetated shingle on the lower reaches. The SSSI is 2252.57 ha and is in an overall favourable condition.
- Non-Statutory Designated Sites
Brantham Bridge Meadow CWS lies directly east of the northern end of the proposed route and approximately 50m north of a further section of the route. This is a low-lying meadow with a recently re-established species-diverse plant community which includes greater bird's-foot trefoil, southern marsh-orchid and ragged-robin. Majority of the proposed route is separated from the CWS by a single field with hedgerow on either side and a stream which runs along the southern border of the CWS. Northern end of the proposed route crosses over a watercourse which connects it to the CWS using an existing crossing.
- Waterbodies
The proposed route crosses a stream which borders Brantham Bridge Meadow CWS. There are two ponds within 250m west of the proposed route.
- Species Records within 500m:
European beech *Fagus sylvatica*; European ash *Fraxinus excelsior*; English oak *Quercus robur*; beaded chestnut *Agrochola lychnidis*; blood-vein *Timandra comae*; brown hare *Lepus europaeus*; buff ermine *Spilosoma luteum*; cinnabar *Tyria jacobaeae*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; dot moth *Melanchra persicariae*; Dunnock *Prunella modularis*; dusky-lemon swallow *Xanthia gilvago*; Eurasian badger *Meles meles*; European Otter *Lutra lutra*; goldcrest *Regulus regulus*; goldfinch *Carduelis carduelis*; great spotted woodpecker *Dendrocopos major*; great tit *Parus major*; green woodpecker *Picus viridis*; green-brindled crescent *Allophyes oxyacanthae*; greenfinch *Carduelis chloris*; grey dagger *Acronicta psi*; house martin *Delichon urbicum*; house sparrow *Passer domesticus*; lapwing *Vanellus vanellus*; latticed heath *Chiasmia clathrate*; lesser calamint *Clinopodium calamintha*; linnet *Linaria cannabina*; long-legged tabby *Synaphe punctalis*; meadow pipit *Anthus pratensis*; mouse moth *Amphipyra tragopoginis*; oak hook-tip *Watsonalla binaria*; pied wagtail *Motacilla alba* subsp. *yarrellii*; robin *Erithacus rubecula*; rustic *Hoplodrina blanda*; shaded broad-bar *Scotopteryx chenopodiata*; skylark *Alauda arvensis*; sloe carpet *Aleucis distinctata*; small phoenix *Ecliptopera silaceata*; song thrush *Turdus philomelos*; stag beetle *Lucanus cervus*; starling *Sturnus vulgaris*; west European hedgehog *Erinaceus europaeus*; white ermine *Spilosoma lubricipeda*; wren *Troglodytes troglodytes*

Survey Results

- The field surveys undertaken identified the following habitat types: Improved grassland, dense-continuous scrub, arable farmland with associated boundary hedgerows, rail embankment of scrub.
- The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:
- Bat: There foraging/commuting potential along the rail embankment adjacent to the proposed route. Buildings adjacent to the proposed route have potential to support roosting bats.
 - Badgers: No evidence found at the time of survey. Suitable habitat for badgers within rail embankment and scattered scrub.
 - Birds: There is potential for breeding birds in scrub and trees along the new route option.
 - Great crested newts: There is potential for great crested newts within 250m of the pond in rail embankment.
 - Reptiles: There is potential for reptiles within scrub, railside grassland and arable field margins.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	The proposed route is located 1.1km north of Stour Estuary SSSI and Stour and Orwell Estuaries SPA and is separated by built areas and arable fields. No large scale habitat loss or fragmentation within CWS, further botanical surveys to undertaken to assess quality of habitats to be lost and inform detailed design to avoid removal of sensitive habitats	N/A
Priority Habitats	Unlikely	The pond is separated from route by residential properties and associated land and will not be directly affected.	N/A
Bats	Unlikely	Removal of trees is not anticipated for this route option. Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	Badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within Zol of the proposed works during the survey. Rail embankment provides suitable habitat for sett creation and foraging however, similar habitats are widely present in the surrounding area and thus small loss of habitat will have a negligible impact.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme	N/A
Great crested newts	Unlikely	No works proposed at the twater bodies within 250m of the proposed route. Vegetation clearance will be minimal and will not result in any long-term loss of large areas of suitable habitat or result in permanent or temporary habitat fragmentation.	G
Otters	N/A	No habitat suitability within the Zol of the scheme	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No habitat suitability within the Zol of the scheme	N/A
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Stag beetle have been recorded within 500m of the proposed route. No suitable habitat to be removed	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.3 Crossing: S03 Buxton Wood

Site location:
IP9 2DB

Grid Reference:
TM 12023 37072

Survey Date:
13/04/2016
&10/01/17

Desk Study Results

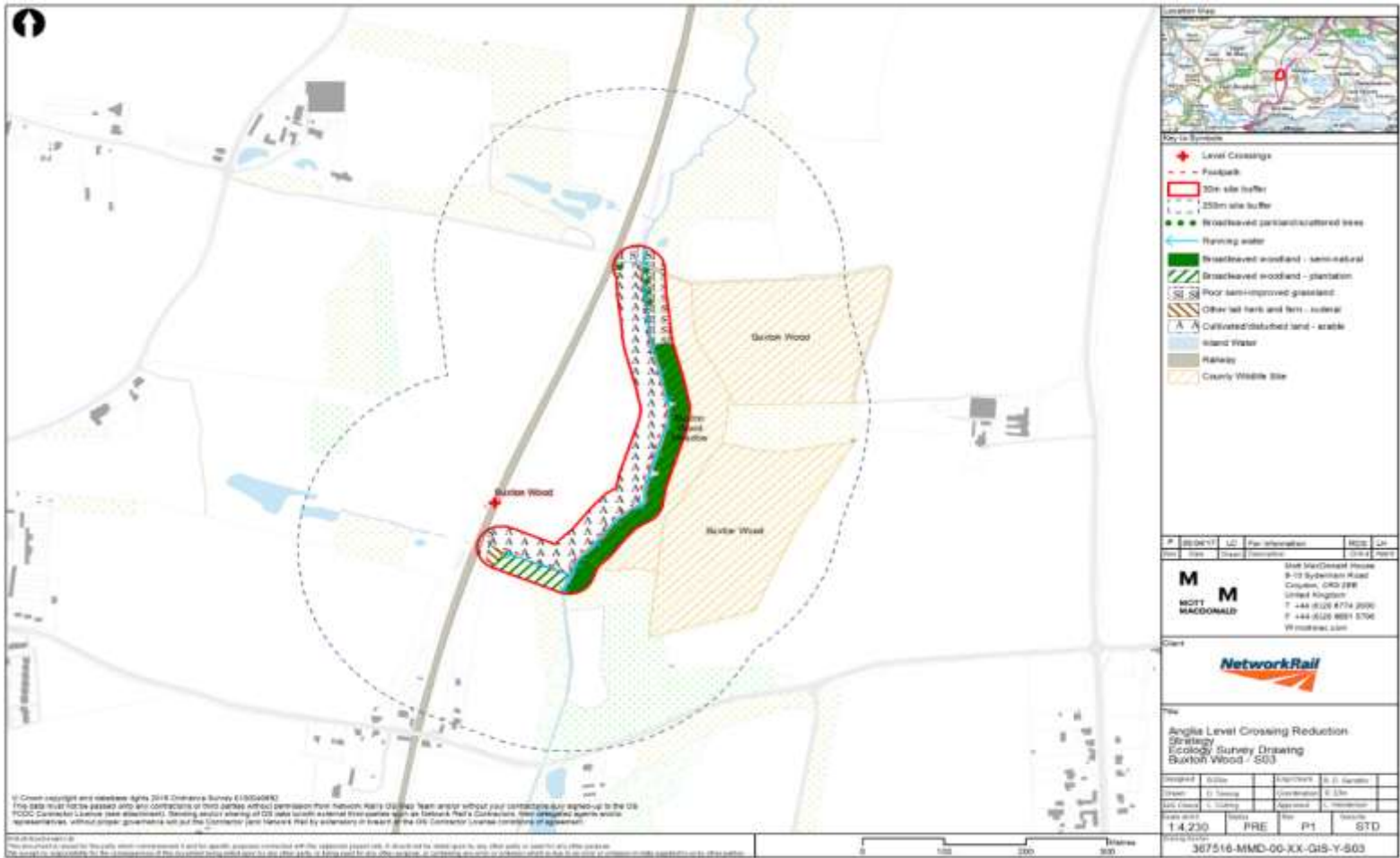
- Statutory Designated Sites
None present within 2km of the scheme.
- Non-Statutory Designated Sites
Buxton Wood Meadow CWS lies directly adjacent to the east of the proposed route. This is an extensive grassland of 2.62 ha which does not appear to have been treated with agricultural chemicals. Its western side, which is next to the proposed route, is bordered by a stream fringed with mature alders and willows.
Buxton Wood CWS is located 80m east of the proposed route, separated by Buxton Wood Meadow CWS. This is an ancient wood of 7.29 ha divided into two parts which are separated by fences which enclose a grassy strip approximately thirty metres wide. The wood is dominated by mature sweet chestnut coppice with overgrown hazel scrub. In addition, there are a few scattered oak, cherry and apple standards. Field maple and hazel coppice form a stand in the south west corner and holly is abundant throughout. The wood is managed for game rearing and timber is stacked in several places to provide shelter for pheasants. A range of birds breed in the wood.
- Waterbodies
A watercourse runs adjacent to the east of the proposed route, no crossings proposed. There are nine waterbodies within 250m of the proposed route.
- Species Records within 500m:
English oak *Quercus robur*; American mink *Neovison vison*; brown hare *Lepus europaeus*; Chinese muntjac *Muntiacus reevesi*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; common toad *Bufo bufo*; eastern grey squirrel *Sciurus carolinensis*; Eurasian badger *Meles meles*; great tit *Parus major*; harvest mouse *Micromys minutus*; little owl *Athene noctua*; marsh frog *Pelophylax ridibundus*; pipistrelle bat species *Pipistrellus*; robin *Erithacus rubecula*; smooth newt *Lissotriton vulgaris*; stag beetle *Lucanus cervus*; starling *Sturnus vulgaris*; west European hedgehog *Erinaceus europaeus*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable farmland, poor-semi improved grassland, tall ruderal, scattered mature trees, stream, woodland.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bats: the watercourse and woodland adjacent to the proposed route have potential to support foraging/commuting activity by bats.
- Badgers: There is suitable habitat for badgers along the proposed route. No setts were observed within the Zol however badger prints were observed during the survey.
- Birds: There is potential for breeding birds in scrub and trees adjacent to the new route option.
- Great crested newts: There is potential for great crested newts within 250m of the route.
- Otters: No holt identified along the route of the proposed alignment. There is suitable habitat to support commuting and foraging habitat for otter along stream. Otter prints were observed during the survey.
- Reptiles: There is potential for reptiles within grass and scrub adjacent to the proposed route.
- Water voles: Suitable habitat along stream.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	The watercourse forms the western border of Buxton Wood Meadow CWS. The proposed route runs adjacent to the CWS, no vegetation removal is required within the CWS and no additional lighting required.	N/A
Priority Habitats	Unlikely	No crossings are proposed over the watercourse as part of the scheme. Vegetation clearance for the proposed route will be minimal and will not impact the adjacent ancient woodland.	N/A
Bats	Unlikely	Pipistrelle's have been previously recorded within 500m of the route. Removal of trees is not anticipated and vegetation clearance along the proposed route will be minimal. Habitat loss will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	There is suitable foraging habitat within the Zol of the proposed works. Badgers have been previously recorded within 500m of the proposed route. Badger prints were observed along the proposed route. No badger setts were observed during the survey. Woodland provides suitable habitat for badgers however, no impact anticipated to woodland.	F
Breeding birds	Unikely	Habitats present have suitability to support common species of nesting bird. Vegetation clearance for this route option will be minimal and would not result in any long term habitat loss.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme	N/A
Great crested newts	Unlkely	Nine water bodies are within 250m of the proposed route. Vegetation clearance will be minimal and will not result in any long-term loss of large areas of suitable habitat or result in permanent or temporary habitat fragmentation.	G
Otters	Unknown	Route lies adjacent to suitable commuting and foraging habitat. Suitable habitat for holts within adjacent woodland. Further survey required to inform detailed design / suitable mitigation.	Refer to Section 4
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	Unlikely	No water crossings required for the proposed route.	N/A
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Stag beetle and West European Hedgehog have been recorded within 500m of the proposed route. No removal of suitable habitat	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.4 Crossing: S04 Island

Site location:
IP9 2LP

Grid Reference:
TM 12309 38236

Survey Date:
13/04/2016

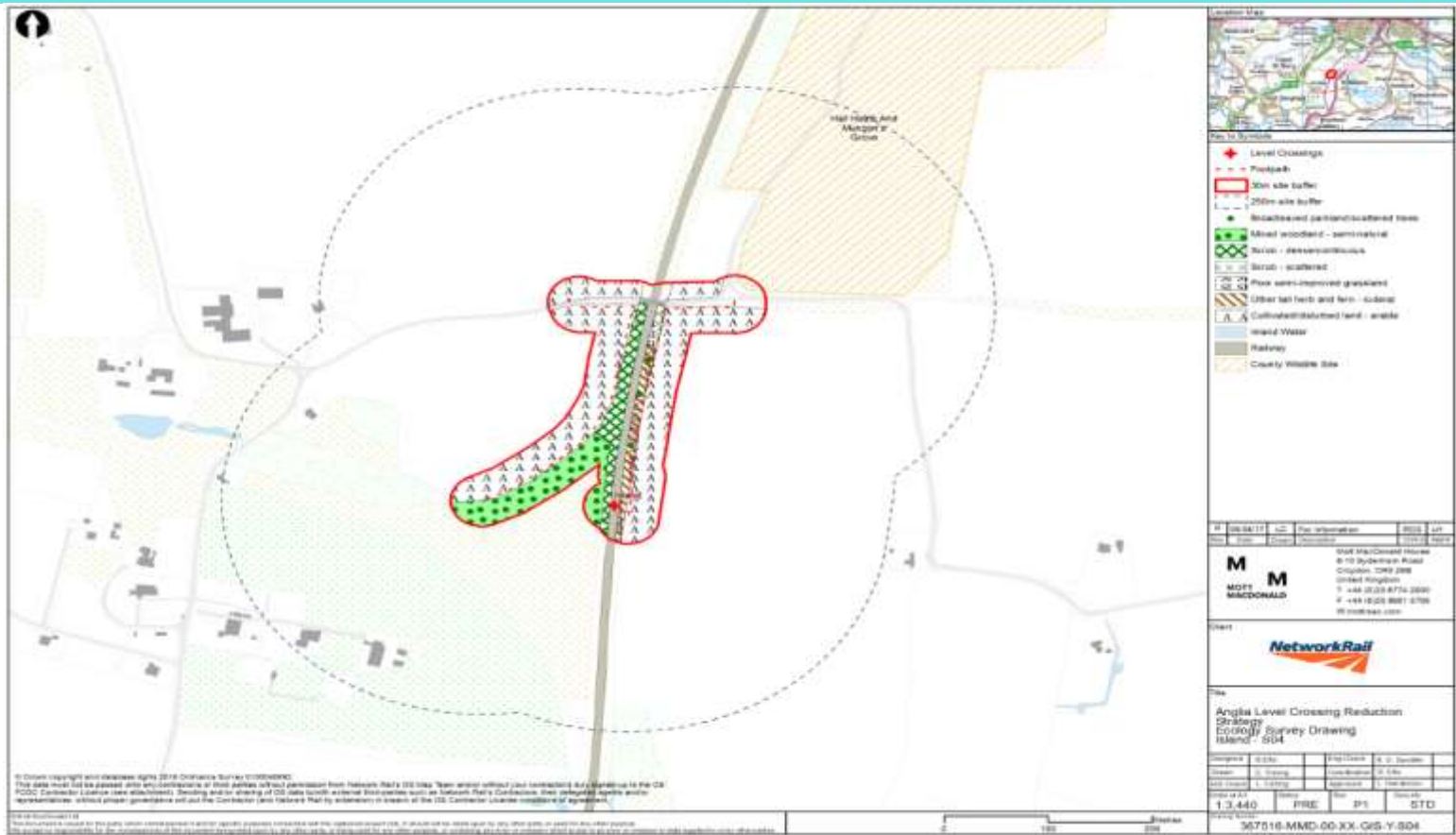
Desk Study Results

- Statutory Designated Sites
Freston and Cutler's Woods with Holbrook Park SSSI is located approximately 1.8km east of the proposed route. This 142 ha site is designated as the largest area of ancient woodland in Suffolk, containing a variety of woodland types.
- Non-Statutory Designated Sites
Hall Heath and Mungon's Grove CWS lies approximately 80m north east of the proposed route. This is a 10.6 ha of mixed woodland which has been shown to support a significant population of hazel dormice.
- Waterbodies
A stream is located 30m south of the proposed route.
- Species Records within 500m:
European ash *Fraxinus excelsior*; brown hare *Lepus europaeus*; brown long-eared bat *Plecotus auritus*; daubenton's bat *Myotis daubentonii*; eastern grey squirrel *Sciurus carolinensis*; Eurasian badger *Meles meles*; hazel dormouse *Muscardinus avellanarius*; kestrel *Falco tinnunculus*; little owl *Athene noctua*; long-eared bat species *Plecotus*; natterer's bat *Myotis nattereri*; common pipistrelle *Pipistrellus pipistrellus*; pipistrelle bat species *Pipistrellus*; serotine *Eptesicus serotinus*; soprano pipistrelle *Pipistrellus pygmaeus*; stag beetle *Lucanus cervus*; tawny owl *Strix aluco*; unidentified bat *Myotis*; west European hedgehog *Erinaceus europaeus*; western barbastelle *Barbastella barbastellus*; yellowhammer *Emberiza citrinella*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable farmland, scrub, scattered trees, semi-improved grassland, tall ruderal, broad-leaved/mixed woodland. The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Priority Habitat: Broadleaved woodland adjacent to proposed route.
- Structures: Bentley Bridge at northern end of the proposed footpath diversion. As part of the proposal there will be no engineering works or lighting scheme designs that impact the structure.
- Bat: Moderate potential for roosting bats in several trees in the woodland immediately west of the existing crossing. Habitats adjacent to the proposed route have potential to support foraging/commuting activity by bats (woodland).
- Badgers: Suitable habitat for badgers along proposed route and within adjacent woodland. Evidence of badgers (foraging signs) observed along the proposed route.
- Birds: There is potential for breeding birds in areas of scrub and trees along the new route option.
- Dormice: There is suitable habitat for dormice along the proposed route.
- Reptiles: There is potential for reptiles within tall ruderal, semi-improved grassland and scrub.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	Freston and Cutler's Woods with Holbrook Park SSSI and the proposed route are separated by agricultural fields, residential areas, and Alton Water Reservoir. Route lies outside the boundary of the CWS. Access to the CWS would be unchanged. No implications for loss of habitat or disturbance. No potential loss of integrity of the CWS	N/A
Priority Habitats	Unlikely	Due to small scale, localised nature of the works, no impact anticipated to adjacent watercourse or woodland.	N/A
Bats	Unlikely	No impact anticipated to woodland. No vegetation clearance of woodland. Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas that bats can forage and commute and works would not result in fragmentation of habitats. No additional lighting proposed.	N/A
Badgers	Unlikely	Badgers have been previously recorded within 500m of the proposed route. The proposed route would not result in the loss of large areas of suitable foraging habitat.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	Unlikely	Hazel dormice have been previously recorded within 500m of the proposed route. Proposed route to utilise existing arable field margins and gaps in hedgerow where possible. Minimal vegetation clearance required.	H – Refer to Section 4
Great crested newts	N/A	No habitat suitability within the ZoI of the scheme	N/A
Otters	N/A	No habitat suitability within the ZoI of the scheme. Otters have not been previously recorded within 500m of the proposed route.	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No habitat suitability within the ZoI of the scheme	N/A
White clawed crayfish	N/A	No habitat suitability within the ZoI of the scheme	N/A
Other notable species	N/A	None found at the time of survey. West European Hedgehog have been previously recorded within 500m of the proposed route.	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.5 Crossing: S05 Pannington Hall

Site location:
IP9 2AR

Grid Reference:
TM 13974 40549

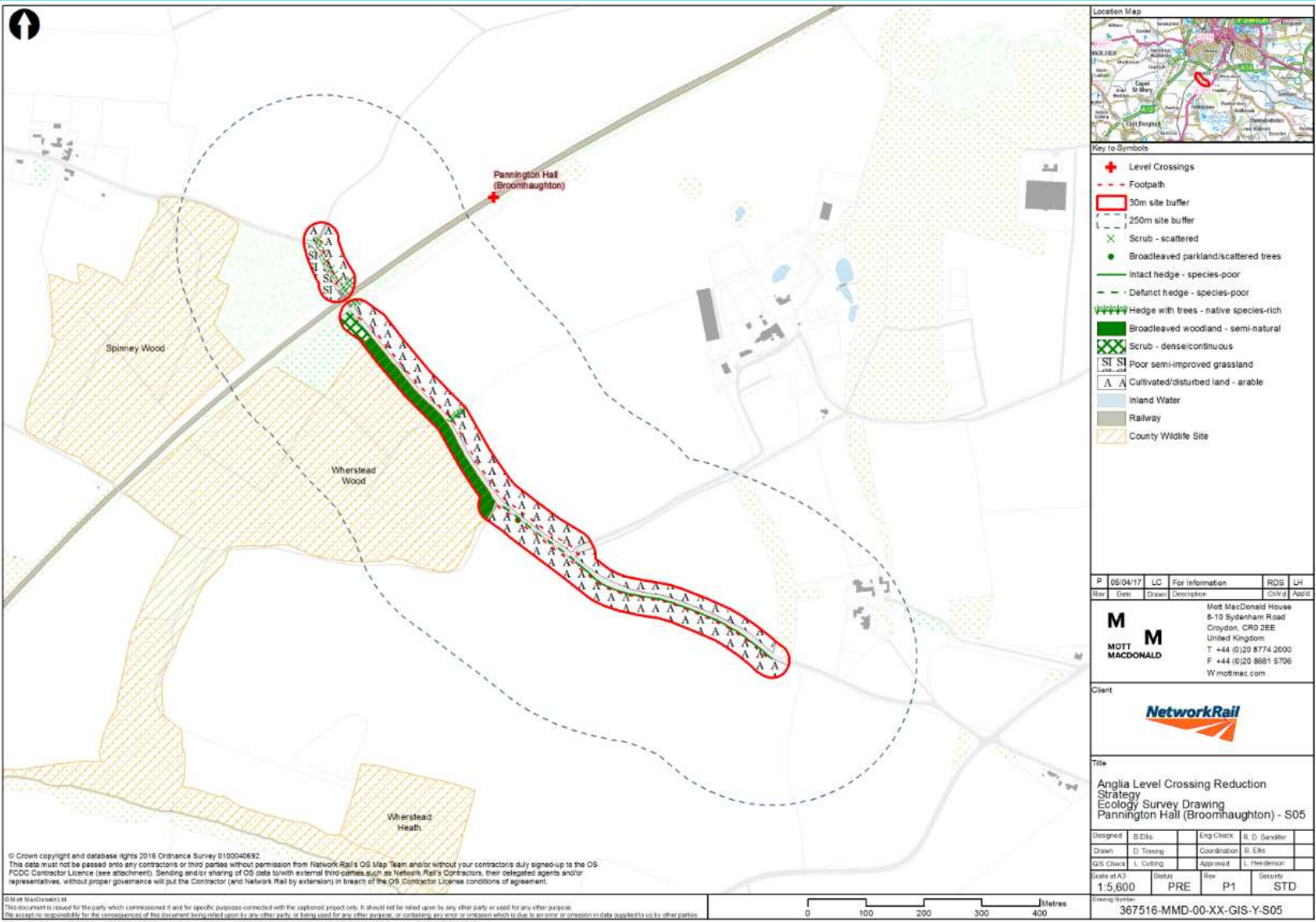
Survey Date:
04/05/16 & 10/01/17

Desk Study Results

- Statutory Designated Sites
Freston and Cutler's Woods with Holbrook Park SSSI is located approximately 800m south of the proposed route. Bobbitshole Belstead SSSI is approximately 1.1km north east of the proposed site.
- Non-Statutory Designated Sites
Spinney/Wherstead Wood with southern linear woodland CWS lies directly to the west of the proposed route. This is a large ancient woodland site of 35.25 ha, which is listed in Natural England's Ancient Woodland Inventory, bisected by the main Ipswich railway line. Wherstead Wood, south of the railway line, is 25m from the proposed route and separated by a field margin and paved road. Spinney Wood, north of the railway line, is 210m from the route, separated by a paved road and area of open scrub / grassland.
- Waterbodies
Series of five ponds within the grounds of Pannington Hall, to the east of the proposed route.
- Species Records within 500m:
bee orchid *Ophrys apifera*; brown hare *Lepus europaeus*; bur medick *Medicago minima*; chaenotheca hispidula *Chaenotheca hispidula*; cinnabar *Tyria jacobaeae*; common frog *Rana temporaria*; common lizard *Zootoca vivipara*; *Cyrtidula hippocastani*; dot moth *Melanchra persicariae*; Eurasian badger *Meles meles*; grass snake *Natrix natrix*; green-brindled crescent *Allophytes oxyacanthae*; hazel dormouse *Muscardinus avellanarius*; lasioglossum (evylaeus) malachurum *Lasioglossum (evylaeus) malachurum*; lasioglossum (evylaeus) pauxillum *Lasioglossum (evylaeus) pauxillum*; lecania cyrtella *Lecania cyrtella*; nightingale *Luscinia megarhynchos*; oak hook-tip *Watsonalla binaria*; punctelia jeckeri *Punctelia jeckeri*; siskin *Spinus spinus*; slow-worm *Anguis fragilis*; small phoenix *Ecliptopera silaceata*; smooth newt *Lissotriton vulgaris*; stag beetle *Lucanus cervus*; tawny owl *Strix aluco*; west European hedgehog *Erinaceus europaeus*; white admiral *limenitis camilla*; white-letter hairstreak *Satyrrium w-album*; white-line dart *Euxoa tritici*; xanthoria ucraninica *Xanthoria ucraninica*; yellowhammer *Emberiza citrinella*.

Survey Results

- The field surveys undertaken identified the following habitat types: Arable/fallow fields, hedgerows, scattered trees, scrub, poor semi improved grassland, and ancient woodland
- The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:
- Priority Habitats: The proposed route is directly adjacent to ancient woodland.
 - Bat: Roosting potential in mature tree along proposed route. Habitats adjacent to the proposed route have potential to support foraging/commuting activity by bats (ancient woodland).
 - Birds: There is potential for breeding birds in hedgerows and areas of scrub along the new route option.
 - Dormice: There is suitable habitat for dormice along the proposed route.
 - Reptiles: There is potential for reptiles within grassland and scrub.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	Freston and Cutler's Woods with Holbrook Park SSSI and the proposed route are separated by agricultural fields. Route located outside CWS. Access to the CWS would be unchanged. No implications for loss of habitat or disturbance. No potential loss of integrity of the CWS	N/A
Priority Habitats	Unlikely	No impacts anticipated to the ancient woodland. The closest pond is located approximately 140m from the route, separated by farm yard and tracks.	N/A
Bats	Unlikely	No impact anticipated. No vegetation clearance of woodland. Clearance of habitats along the proposed route will be minimal. Habitat loss will be very small in the context of the wide areas that bats can forage and commute and works would not result in fragmentation of habitats. No additional lighting proposed.	N/A
Badgers	Unlikely	Badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within Zol of the proposed works during the survey.	F
Breeding birds	Unikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	Unlikely	Hazel dormice have been previously recorded within 500m of the proposed route. The route will require some removal of hederows and dense scrub. Further surveys are required.	H – Refer to Section 4
Great crested newts	N/A	No habitat suitability within the Zol of the scheme	N/A
Otters	N/A	No habitat suitability within the Zol of the scheme	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No habitat suitability within the Zol of the scheme	N/A
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	N/A	None found at the time of survey. West European Hedgehog have been previously recorded within 500m of the proposed route.	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.6 Crossing: S07 Broomfield

Site location:
IP6 0NJ

Grid Reference:
TM 11969 51150

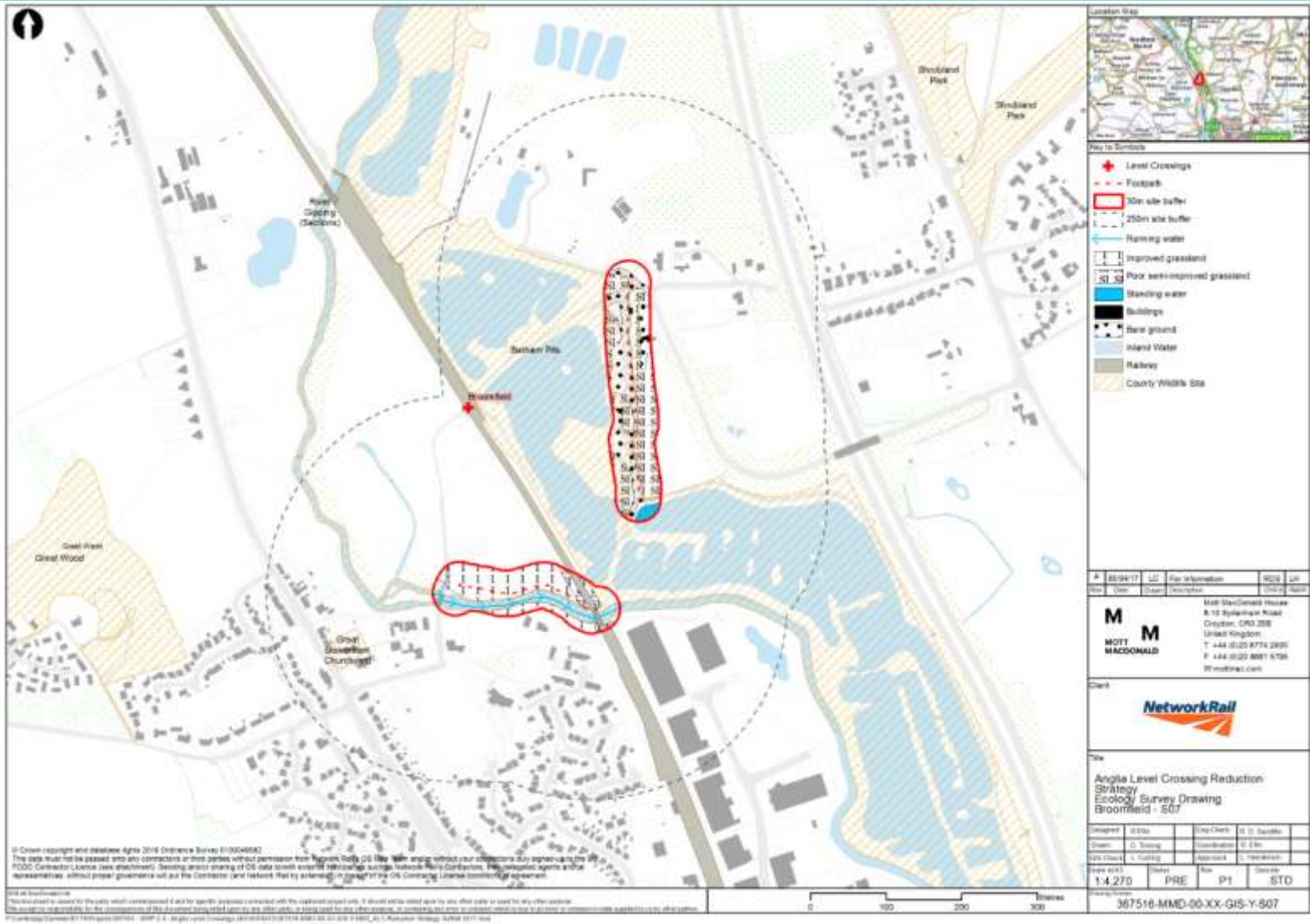
Survey
Date:
06/04/2016

Desk Study Results

- Statutory Designated Sites
Sandy Lane Pit, Barham SSSI is approximately 1.2km north east of the proposed route.
- Non-Statutory Designated Sites
The proposed routes lie within Barham Pits CWS. Barham Pits are a series of old gravel pits situated in the Gipping valley and are of considerable ornithological importance. They provide food and shelter for significant numbers of wintering wildfowl. Large populations of pochard and tufted duck are regularly seen, with smaller numbers of other duck. In Summer, the pits are used by a variety of breeding water birds including tufted duck and great crested grebes. In addition, the pits are a regular stop over for birds on passage, for example common tern, common sandpiper and osprey are frequent visitors. Kingfisher and heron are regularly observed feeding in or around the lakes. Barham Pits are leased to a fishing club and are well-used by local anglers.
Four other CWS sites are present within 500m, not crossed by the proposed route. These include Great Wood CWS, Great Blakenham Churchyard CWS, Shrubland Pits CWS and RNR CWS. These are separated from the proposed route by fields and areas of housing and are no considered further as no impacts on these CWS are anticipated.
- Waterbodies
The proposed route runs within Barham Pits which are a series of large freshwater lakes in old gravel pits. A section of the route runs alongside a stream, no crossing required.
- Species Records within 500m:
American mink *Neovison vison*; bee wolf *Philanthus Triangulum*; brown long-eared bat *Plecotus auritus*; bullfinch *Pyrrhula*; Canada goose *Branta canadensis*; Canadian waterweed *Elodea canadensis*; cinnabar *Tyria jacobaeae*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; compact grimmia *Schistidium confertum*; dunnock *Prunella modularis*; Eurasian badger *Meles meles*; European otter *Lutra lutra*; European water vole *Arvicola amphibius*; goldfinch *Carduelis carduelis*; grass snake *Natrix*; great tit *Parus major*; green woodpecker *Picus viridis*; greenfinch *Carduelis chloris*; hemlock water-dropwort *Oenanthe crocata*; house sparrow *Passer domesticus*; Indian balsam *Impatiens glandulifera*; little egret *Egretta garzetta*; lucerne *Medicago sativa sativa*; common pipistrelle *Pipistrellus pipistrellus*; placynthiella dasaea *Placynthiella dasaea*; pyramidal orchid *Anacamptis pyramidalis*; robin *Erithacus rubecula*; scarce chaser *Libellula fulva*; small scabious *Scabiosa columbaria*; song thrush *Turdus philomelos*; stag beetle *Lucanus cervus*; starling *Sturnus vulgaris*; swift *Apus apus*; west European hedgehog *Erinaceus europaeus*; wren *Troglodytes troglodytes*; Xanthoria uraninica *Xanthoria uraninica*; yellow-wort *Blackstonia perfoliata*.

Survey Results

- The field surveys undertaken identified the following habitat types: Improved grassland, running water and open water. A mosaic of semi-improved grassland and bare ground were noted within the gravel pits.
- The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:
- Bats: Mature trees adjacent to the proposed route have potential to support roosting / foraging/commuting activity by bats.
 - Badgers: Suitable foraging habitat for badgers along proposed route. No badger field signs identified within Zol of the proposed works during the survey.
 - Birds: There is potential for breeding birds in mature trees along the new route option.
 - Otters: There is potential commuting/ foraging habitat for otters along the stream. No signs observed during the survey.
 - Reptiles: There is potential for reptiles within the improved grassland along the route option adjacent to the river.
 - Water voles: There is potential for water voles along the stream. No burrows or signs observed during the survey.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	Impacts on the Sandy Lane Pit, Barham SSSI are unlikely due to the localised, small scale nature of the works. A section of the proposed route goes through the CWS. This section makes use of an existing track and therefore no works are necessary within the CWS. No large scale habitat loss or fragmentation of priority habitats within the CWS. It is anticipated that there is no potential loss of integrity of the CWS	N/A
Priority Habitats	Unlikely	No impact anticipated to the gravel pit lakes to the east of the crossing. Based on the small scale nature of the works and through implementation of best practice to prevent water pollution.	A
Bats	Unlikely	No tree removal is required for the proposed route. Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	Badgers have been previously recorded within 500m of the proposed route. The proposed route would not result in the loss of suitable foraging habitat.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. No tree removal is required for the proposed route.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme	N/A
Great crested newts	Extremely Unlikely	The gravel pits lakes do not provided suitable habitat for great crested newts due to their size, depth and the presence of wildfowl. No great crested newts have been recorded within 500m of the proposed route.	N/A
Otters	Extremely Unlikely	Otters have been recorded within 500m of the proposed route. No water crossings required for the proposed route. No loss of suitable habiata. No lighting proposed	N/A
Reptiles	Unlikely	Grass snakes have been previously recorded within 500m of the proposed route. The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	Extremely Unlikely	Water voles have been recorded within 500m of the proposed route. No water crossings required for the proposed route.	N/A
White clawed crayfish	Extremely Unlikely	No habitat suitability within the Zol of the scheme.	N/A
Other notable species	Extremely Unlikely	None found at the time of survey. Stag beetle and West European Hedgehog have been previously recorded within 500m of the proposed route.	N/A
Invasive plant species	N/A	Indian Balsam has been previously recorded within 500m of the proposed route. None found at the time of survey.	N/A

3.7 Crossing: S08 Stacpool

Site location:
IP6 8LJ

Grid Reference:
TM 10477 53452

Survey Date:
07/04/2016

Desk Study Results

- **Statutory Designated Sites**
Barking Woods SSSI: approximately 1.5km west of the proposed route, separated by arable land and roads.
Creeting St. Mary Pits: approximately 1.5km north of the proposed route, separated by arable land and roads.
- **Non-Statutory Designated Sites:** Two CWSs lie within 500m of the proposed route. Baylham Fishpond, a kettle-hole lake, is situated in the Gipping Valley to the west of the B1113, between Great Blakenham and Needham Market. The site consists of a mosaic of habitats; woodland, open water, marsh, dense scrub and tall fen vegetation. (200m south of proposed route). Lion Inn Meadow & Chalkpit CWS: This site lies adjacent to the Lion Inn, Needham Market. It consists of an area of chalk grassland, bordered in the south by a disused chalk pit. Lion Inn Meadow is enclosed by a hedge, possibly medieval in origin which is composed of oak, field maple, hazel and blackthorn. (490m north of proposed route)
- **Waterbodies**
The River Gipping is 258m east of the proposed route. Gravel pits lie to the east of the proposed route, with bare earth banks and no aquatic/marginal vegetation.
- **Species Records within 500m:**
Eurasian badger *Meles meles*; European otter *Lutra lutra*; European water vole *Arvicola amphibius*; garden tiger *Arctia caja*; ghost moth *Hepialus humuli*; goldcrest *Regulus regulus*; goldfinch *Carduelis carduelis*; great spotted woodpecker *Dendrocopos major*; great tit *Parus major*; green sandpiper *Tringa ochropus*; green woodpecker *Picus viridis*; grey wagtail *Motacilla cinerea*; herring gull *Larus argentatus*; house martin *Delichon urbicum*; jack snipe *Lymnocyrtus minimus*; kestrel *Falco tinnunculus*; kittiwake *Rissa tridactyla*; knot grass *Acronica rumicis*; lapwing *Vanellus vanellus*; lasioglossum (dialictus leucopus *Lasioglossum (dialictus) leucopus*; lesser redpoll *Acanthis cabar*; linnet *Linaria cannabina*; little egret *Egretta garzetta*; little owl *Athene noctua*; marsh tit *Poecile palustris*; meadow pipit *Anthus pratensis*; mottled rustic *Caradrina Mopheus*; mouse moth *Amphipyra tragopoginis*; nightingale *Luscinia megarhynchos*; pied wagtail *Motacilla alba* subsp. *Yarrellii*; common pipistrelle *Pipistrellus pipistellus*; robin *Erthacus rubecula*; rosy minor *Mesoligia literosa*; rosy rustic *Hydraecia micacea*; sand cat's-tail *Phleum arenarium*; sand martin *Riparia riparia*; shelduck *Tadorna tadorna*; shoulder-striped wainscot *Mythimna comma*; siskin *Spinus spinus*; skylark *Alauda arvensis*; small square-spot *Diarsia rubi*; song thrush *Turdus philomelos*; spotted flycatcher *Muscicapa striata*; spotted redshank *Tringa erythropus*; starling *Sturnus vulgaris*; swallow *Hirundo rustica*; swift *Apus apus*; tawny owl *Strix aluco*; treecreeper *Certhia familiaris*; turtle dove *Streptopelia turtur*; wall *Lasiomata megera*; water rail *Rallus aquaticus*; west European hedgehog *Erinaceus europaeus*; wheatear *Oenanthe oenanthe*; wren *Troglodytes troglodytes*; yellow wagtail *Motacilla flava* subsp. *Flavissima*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable fields with associated poor semi-improved grassland field margins. The route lies within an active quarry.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bat: The woodland directly adjacent to the proposed route and the scrub and scattered trees along the route have potential to support foraging/commuting activity by bats.
- Badgers: Suitable habitat for badgers along proposed route. No badger field signs identified within Zol during the survey.
- Birds: There is potential for breeding birds in areas of scrub along the new route option.
- Reptiles: There is potential for reptiles within grassland and scrub.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Extremely unlikely	Impacts on Barking Woods SSSI, Creeping St. Mary Pits SSSI and The River Gipping are extremely unlikely due to the distance and the localised, small scale nature of the works.	N/A
Priority Habitats	Extremely unlikely	As part of the proposal there will be no engineering works or lighting scheme designs that impact the bridge.	N/A
Bats	Unlikely	Vegetation clearance along the proposed route will be minimal. No vegetation clearance is anticipated within the woodland. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	Badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within Zol of the proposed works during the survey. Similar suitable habitats are widely present in the surrounding area and thus small loss of habitat will have a negligible impact.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme.	N/A
Great crested newts	N/A	No great crested newts have been recorded within 500m of the proposed route.The gravel pit lake provides sub-optimal habitat for great crested newts due to its size, depth and lack of marginal and aquatic vegetation.	G
Otters	Extremely Unlikely	Otters have been recorded within 500m of the proposed route however, no there is no suitability terrestrial habitat within the Zol of the scheme. The proposed route does not cross any watercourses.	N/A
Reptiles	Unlikely	No reptiles have been recorded within 500m of the proposed route. The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	Extremely Unlikely	Water voles have been recorded within 500m of the proposed route. No water crossings required for the proposed route.	N/A
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Evidence of rabbit found along route option. West European hedgehog recorded in habitats adjacent to the proposed route.	J
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.8 Crossing: S13 Fords Green

Site location:
IP14 4HN

Grid Reference:
TM 05527 66425

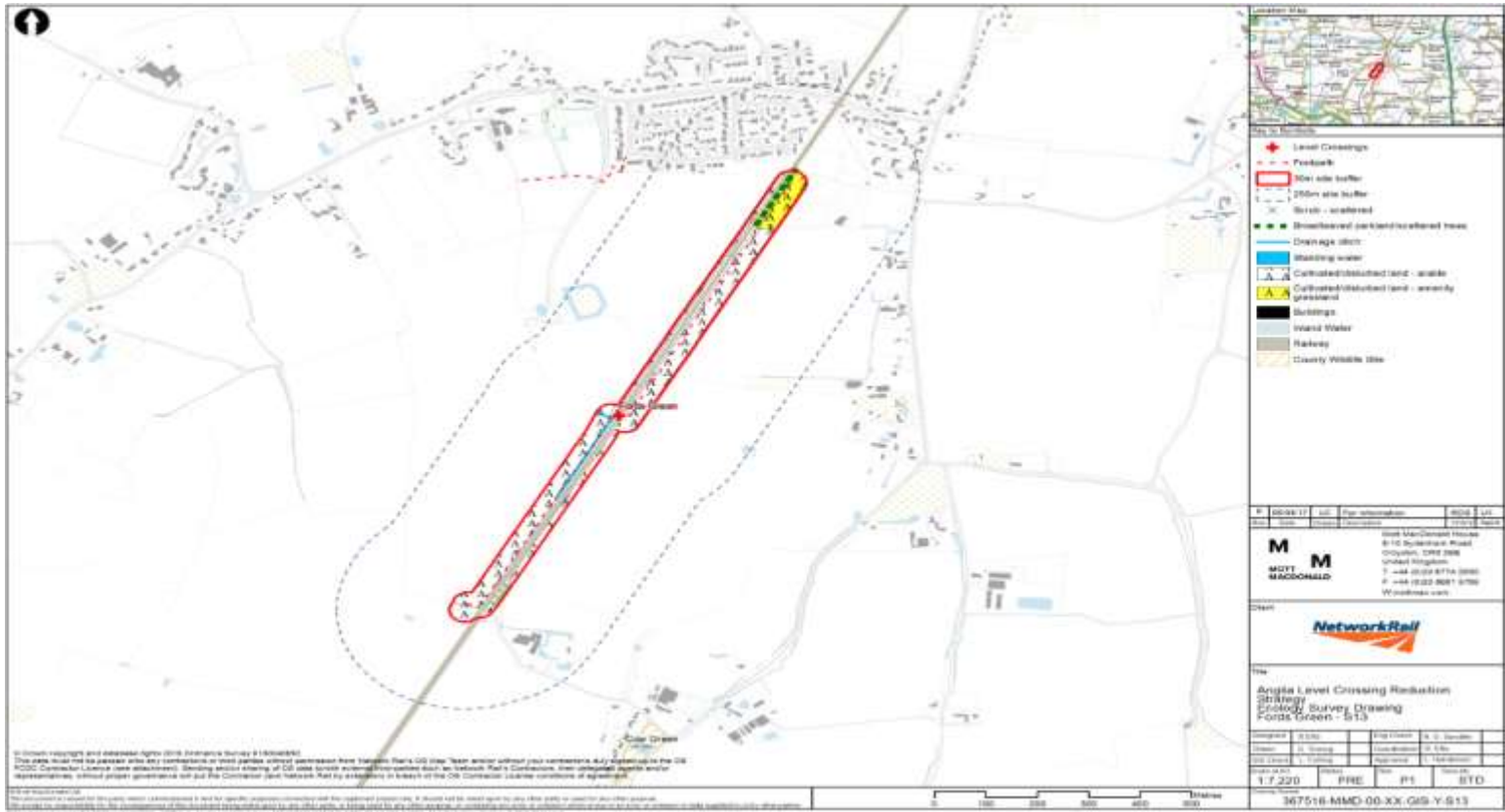
Survey Date:
04/05/16

Desk Study Results

- Statutory Designated Sites
None present within 2km of the scheme.
- Non-Statutory Designated Sites
None present within 500m of the scheme
- Waterbodies
There are eight waterbodies within 250m of the proposed works. One small pond is located to the south of the crossing, adjacent to the eastern side of the railway . A drainage ditch is located south of the proposed route and is culverted under an existing farm track. The route crosses a drainage ditch to the west.
- Species Records within 500m:
Brown hare *Lepus europaeus*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; common frog *Rana temporaria*; dunnock *Prunella modularis*; eastern grey squirrel *Sciurus carolinensis*; European water vole *Arvicola amphibius*; field maple *Acer campestre*; goldfinch *Carduelis carduelis*; great crested newt *Triturus cristatus*; great spotted woodpecker *Dendrocopos major*; great tit *Parus major*; green woodpecker *Picus viridis*; greenfinch *Carduelis chloris*; house sparrow *Passer domesticus*; pied wagtail *Motacilla alba*; robin *Erthacus rubecula*; smooth newt *Lissotriton vulgaris*; song thrush *Turdus philomelos*; starling *Sturnus vulgaris*; swift *Apus apus*; west European hedgehog *Erinaceus europaeus*; wren *Troglodytes troglodytes*.

Survey Results

- The proposed route was not accessible, aerial imagery identified the following habitat types: Arable fields, amenity grassland, scattered trees and scrub and standing water (pond and drainage ditch).
- The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:
- Bats: There is suitable commuting/ foraging habitat within the areas of scrub and scattered trees adjacent to the railway.
 - Badgers: Suitable foraging habitat for badgers along proposed route. No badger field signs identified within Zol of the proposed works during the survey.
 - Birds: There is potential for breeding birds in areas of scrub along the proposed route.
 - Great crested newts: There is suitable habitat for great crested newts within 250m of the proposed route.
 - Reptiles: There is potential for reptiles within arable field margin and scrub.
 - Water voles: There is potential for water voles within a ditch that requires crossing along the proposed route, directly west of the crossing. Further surveys required in 2017 to assess habitat suitability at location of water course crossing.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	N/A	None present	N/A
Priority Habitats	Extremely unlikely	No impacts anticipated to the ponds. The construction of the footbridge would be bank to bank with no disruption of water flow.	A
Bats	Unlikely	Vegetation clearance along the proposed route will be minimal. Habitat loss will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	No badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within Zol of the proposed works during the survey.	N/A
Breeding birds	Unikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme	N/A
Great crested newts	N/A	Great crested newt have been previously recorded within 500m of the proposed route. Vegetation clearance along the proposed route will be minimal. No impact anticipated to the water bodies within 250m of the proposed route.	G
Otters	Extremely unlikely	Drainage ditch does not provide suitable habitat for otters. No previous records of otters within 500m of the scheme.	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	Unlikely	Water voles have been recorded within 500m of the proposed route. If present, the proposed works would have a low impact on this species. Any loss of foraging habitat will be temporary and the area very small in the context of the surrounding habitats. Works will not result in any long-term loss of large areas of suitable water vole habitat or result in permanent or temporary habitat fragmentation.	D – Refer to Section 4
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Evidence of rabbit found along route option. West European Hedgehog have been previously recorded within 500m of the proposed route.	J
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.9 Crossing: S16 Gislingham

Site location:
IP19 2DB

Grid Reference:
TM 07479 70010

Survey Date:
06/05/16

Desk Study Results

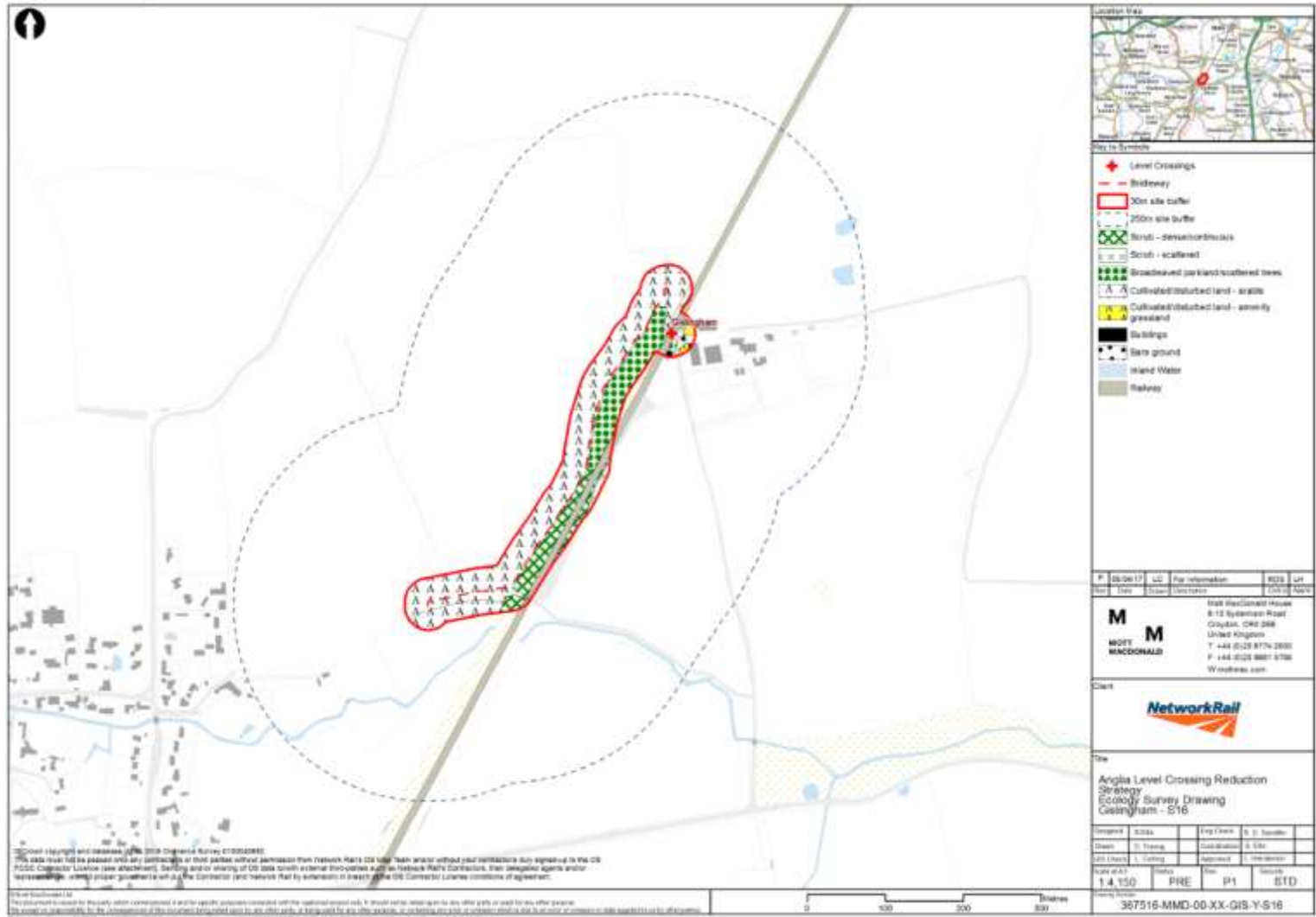
- Statutory Designated Sites
 - None present within 2km of the scheme.
- Non-Statutory Designated Sites
 - None present within 500m of the scheme.
- Waterbodies
 - There are four ponds located within 250m from the proposed route. The ponds are located over 160m east separated by a farm. No crossings over the river are required.
- Species Records within 500m:
 - Brown long-eared bat *Plecotus auritus*; collared dove *Streptopelia decaocto*; common toad *Bufo bufo*; dunnock *Prunella modularis*; English oak *Quercus robur*; great tit *Parus major*; house sparrow *Passer domesticus*; common pipistrelle *Pipistrellus pipistellus*; robin *Erthacus rubecula*; starling *Sturnus vulgaris*; tall-clustered thread-moss *Bryum pallescens*; west European hedgehog *Erinaceus europaeus*.

Survey Results

The field surveys undertaken identified the following habitat types: Scattered trees, scrub, and arable. Bare ground (hardstanding) and amenity grassland associated with farm also lies within 30m of the proposed route.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bats: Mature trees in the surrounding area have potential to support roosting, foraging and commuting activity by bats. Watercourses provide suitable foraging habitat for bats. The route makes use of an existing underbridge.
- Badgers: Suitable foraging habitat for badgers along proposed route. No badger field signs identified within ZoI of the proposed works during the survey.
- Birds: There is potential for breeding birds in areas of scrub along the proposed route.
- Great crested newts: There is potential for great crested newts within 250m of the waterbodies.
- Reptiles: There is potential for reptiles within grassland and scrub.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	N/A	No designated sites present within 2km of the scheme.	N/A
Priority Habitats	Extremely unlikely	No impact anticipated to the water bodies within the ZoI of the proposed route.	N/A
Bats	Unlikely	No impact anticipated to the underbridge. No tree removal is required for the proposed route. Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed. No impact anticipated on watercourses.	N/A
Badgers	Unlikely	No badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within ZoI of the proposed works during the survey. The proposed route would not result in the loss of suitable foraging habitat.	N/A
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the ZoI of the scheme. No previous records of dormice within 500m of the scheme.	N/A
Great crested newts	Unlikely	Great crested newt have been previously recorded within 500m of the proposed route. Vegetation clearance along the proposed route will be minimal. No impact anticipated to the water bodies in the surrounding areas of the proposed route.	G
Otters	Extremely unlikely	No previous records of otters within 500m of the scheme. No crossings required and no impact anticipated to the stream.	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	Extremely unlikely	No previous records of water voles within 500m of the scheme. No crossings required and no impact anticipated to the stream.	N/A
White clawed crayfish	Extremely unlikely	No previous records of white clawed crayfish within 500m of the scheme. No crossings required and no impact anticipated to the stream.	N/A
Other notable species	N/A	West European Hedgehog have been previously recorded within 500m of the proposed route.	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.10 Crossing: S17 Paynes

Site location:
IP14 4EY

Grid Reference:
TM 04537 64595

Survey Date:
06/04/2016

Desk Study Results

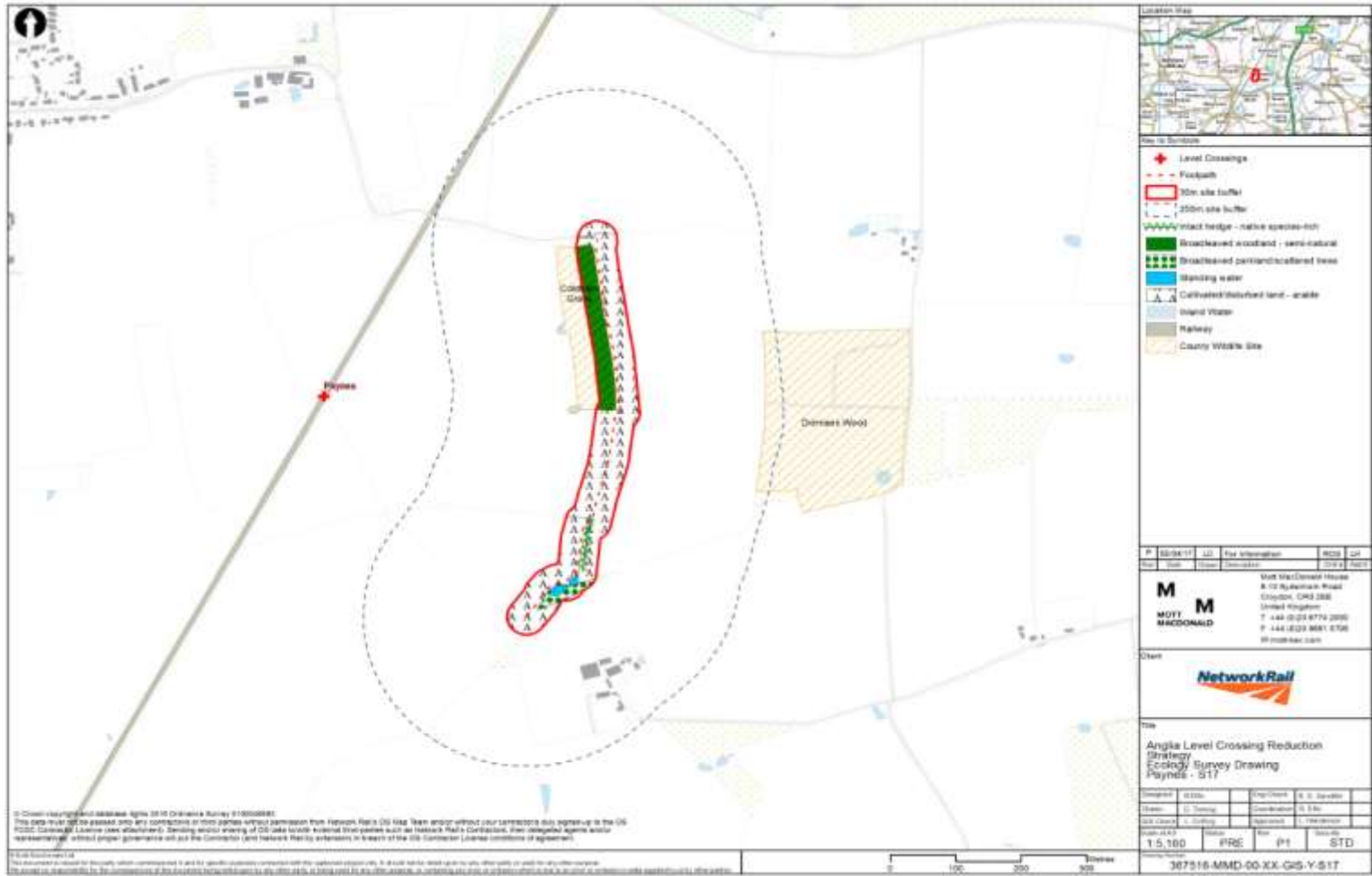
- Statutory Designated Sites
None present within 2km of the scheme.
- Non-Statutory Designated Sites
Coldham Grove CWS: proposed route runs directly adjacent to the northern and eastern border of this designated site.
Dormans Wood CWS. No citation available for these sites.
- Waterbodies
There are four ponds within 250m of the proposed route. Two ponds are located directly south and two ponds are located 70m east, separated by woodland.
- Species Records within 500m:
Brown hare *Lepus europaeus*; eastern grey squirrel *Sciurus carolinensis*; English Oak *Quercus robur*; greater burnet-saxifrage *Pimpinella major*; house sparrow *Passer domesticus*; kestrel *Falco tinnunculus*; little owl *Athene noctua*; starling *Sturnus vulgaris*; west European hedgehog *Erinaceus europaeus*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable farmland, intact hedgerow, scattered mature/semi-mature trees, scrub, woodland and ponds.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bat: The woodland has potential to support roosting, foraging and commuting activity by bats.
- Badgers: There is potential for badgers within the adjacent woodland and foraging habitat along the proposed route.
- Birds: There is potential for breeding birds within the woodland, scrub and hedgerow along the proposed route.
- Great crested newts: There is potential for great crested newts within 250m of the route.
- Reptiles: There is potential for reptiles within arable field margins and scrub.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	Proposed route makes use of existing field margin. No vegetation clearance is required within the CWSs. Access to the CWS would be unchanged. No implications for loss of habitat or disturbance. No potential loss of integrity of the CWS.	N/A
Priority Habitats	Unlikely	No impact anticipated to the water bodies within the ZoI of the proposed route.	N/A
Bats	Unlikely	Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	No badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within ZoI of the proposed works during the survey. The proposed route would not result in the loss of suitable foraging habitat.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the ZoI of the scheme	N/A
Great crested newts	Unlikely	Great crested newt have not been previously recorded within 500m of the proposed route. Vegetation clearance along the proposed route will be minimal. No impact anticipated to the ponds adjacent to the proposed route.	N/A
Otters	N/A	No habitat suitability within the ZoI of the scheme	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No habitat suitability within the ZoI of the scheme	N/A
White clawed crayfish	N/A	No habitat suitability within the ZoI of the scheme	N/A
Other notable species	Unlikely	West European Hedgehog recorded within habitats adjacent to the proposed route.	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.11 Crossing: S24 Higham Ground Frame

Site location:
IP28 6NS

Grid Reference:
TL 75738 66047

Survey Date:
11/04/2016

Desk Study Results

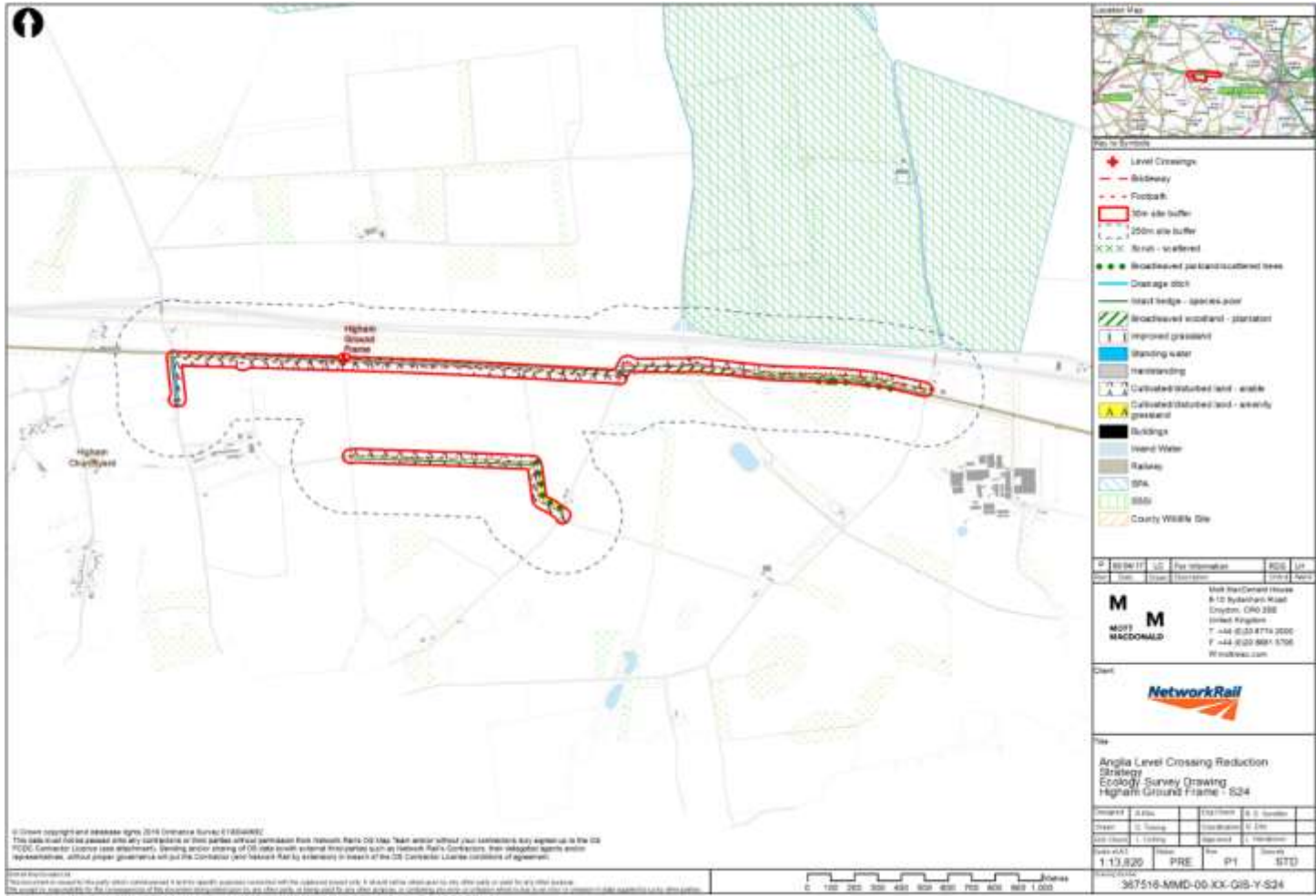
- Statutory Designated Sites
Breckland Farmland SPA and SSSI is located 180m north of the proposed route. This site is notified for its internationally important population of stone curlew *Burhinus oedichnemus*.
- Non-Statutory Designated Sites: One CWS is located approximately 300m south west of the proposed route. Higham Churchyard CWS. The unimproved swards of Higham Churchyard support a highly diverse plant community. Botanical surveys have identified over 70 species of flowering plants. Wood anemone, goldilocks buttercup, meadow saxifrage and salad burnet are amongst the more uncommon species recorded
- Waterbodies: There are two drainage ditches, two ponds and a stream located within 250m of the proposed routes. Proposed steps and timber footbridge over ditch to the west.
- Species Records within 500m: Adonis' ladybird *Hippodamia (adonia) variegata*; ; brown long-eared bat *Plecotus auritus*; chalk hill blue *Polommatus (lysandra) coridon*; Chinese muntjac *Muntiacus reevesi*; clustered bellflower *Campanula glomerata*; corn marigold *Glebionis segetum*; diazosma hirtipenne *Diazosma hirtipenne*; European otter *lutra lutra*; great grey shrike *Lanius excubitor*; harebell *Campanula rotundifolia*; hoary mullein *Verbascum pulverulentum*; lesser screw-moss *Syntrichia virescens*; oval-leaved pottia *Pterygoneurum ovatum*; common pipistrelle *Pipistrellus pipistrellus*; *Punctella jeckeri*; *Rinodina calcarea*; west European hedgehog *Erinaceus europaeus*.

Survey Results

The field surveys undertaken within accessible areas and aerial imagery for non-accessible areas (east section opposite woodland) identified the following habitat types: Arable fields, improved grassland, hedgerow, hardstanding, scattered scrub, amenity grassland, drainage ditch and stream along field boundaries (not visible on maps) scattered trees and broadleaved woodland.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bats: The trees adjacent to the proposed route have potential to support roosting/ foraging/commuting activity by bats.
- Badgers: Suitable foraging habitat for badgers along proposed route. No badger field signs identified within Zol of the proposed works during the survey.
- Birds: There is potential for breeding birds in the broadleaved woodland, hedgerows and scattered scrub along the proposed route.
- Otters: There is potential for otters along the stream to the east and within the woodland.
- Reptiles: There is potential for reptiles within the improved grassland along the proposed route and marginal habitats.
- Water voles: There is potential for water voles along the ditch and stream. No burrows or signs observed during initial survey.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	Breckland Farmland SPA SSSI and the proposed route are separated by arable fields and a motorway. Stone curlews have not been previously recorded within 500m of the scheme.	N/A
Priority Habitats	Unlikely	The construction of the footbridge would be bank to bank with no disruption of water flow. No impact anticipated to the stream located 180m north of the proposed route.	A
Bats	Unlikely	Vegetation clearance along the proposed route will be minimal. No loss of potential roost sites anticipated. Habitat loss will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	No badger field signs identified within Zol of the proposed works during the survey. The proposed route would not result in the loss of suitable foraging habitat.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme	N/A
Great crested newts	Extremely unlikely	The A14 separates the pond from the proposed route. No habitat suitability within the drainage ditches or stream. There are no previous records of great crested newts within 500m of the proposed route.	N/A
Otters	Unlikely	Otters have been recorded within 500m of the proposed route. The proposed works will not result in any long-term loss of large areas of suitable habitat or result in permanent or temporary habitat fragmentation	E
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	Unlikely	If present, the proposed works would have a low impact on this species. Any loss of foraging habitat will be temporary and the area very small in the context of the surrounding habitats. Works will not result in any long-term loss of large areas of suitable water vole habitat or result in permanent or temporary habitat fragmentation.	D– Refer to Section 4
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Clustered Bellflower, Corn Marigold, Harebell, Hoary Mullein rare plants in Suffolk recorded within 500m of the proposed route. West European Hedgehog	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.12 Crossing: S25 Cattishall

Site location:
IP32 7GQ

Grid Reference:
TL 88556 65083

Survey Date:
11/04/2016
03/05/2016

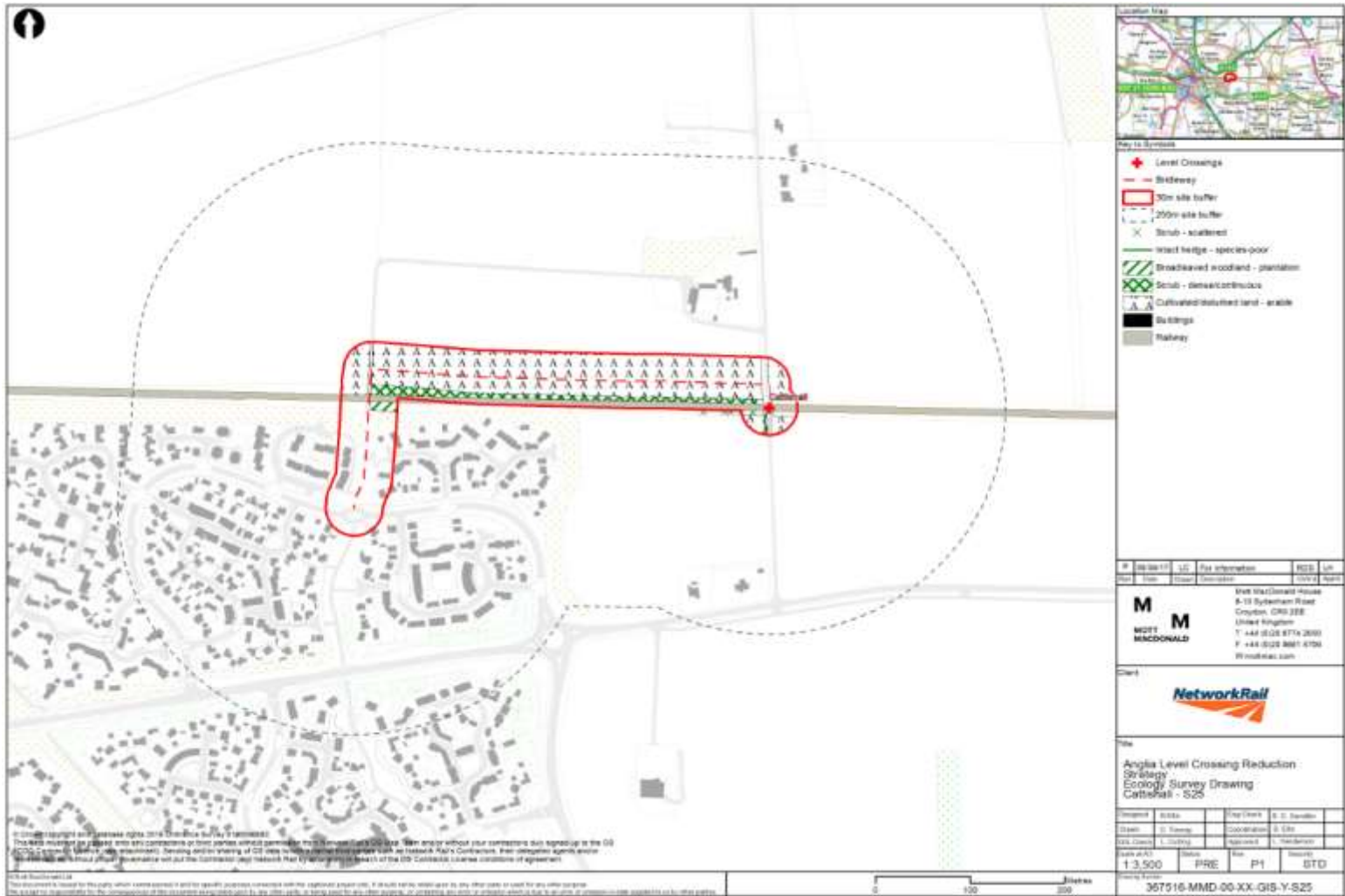
Desk Study Results

- Statutory Designated Sites
Glen Chalk Caves SSSI is located 1.6km south west of the proposed route. (Not shown on map)
- Non-Statutory Designated Sites
None present within 500m of the proposed route.
- Waterbodies
There are no water bodies within 250m of the proposed route.
- Species Records within 500m:
Brown hare *Lepus europaeus*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; common pipistrelle *Pipistrellus pipistrellus*; dunnoek *Prunella modularis*; English oak *Quercus robur*; Eurasian badger *Meles meles*; goldfinch *Carduelis carduelis*; great tit *Parus major*; house sparrow *Passer domesticus*; pied wagtail *Motacilla alba*; robin *Erthacus rubecula*; song thrush *Turdus philomelos*; starling *Sturnus vulgaris*; west European hedgehog *Erinaceus europaeus*; wren *Troglodytes troglodytes*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable, hedgerows and scrub. Broadleaved woodland within 30m of proposed route on opposite side of railway.
The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bats: Low potential for roosting bats within underbridge. Scrub and adjacent woodland along the proposed route have potential to support foraging/commuting activity by bats. Mature pedunculate oak – veteran tree within 500m of route (not mapped). Bat inspection surveys identified no potential roosts along the proposed route.
- Badgers: Suitable habitat for badgers along proposed route. No badger field signs identified within ZoI of the proposed works during the survey.
- Birds: There is potential for breeding birds along the new route option.
- Reptiles: There is potential for reptiles within grassland and scrub



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	No impact anticipated to Glen Chalk Caves SSSI. Proposed route and SSSI are separated by residential houses.	N/A
Priority Habitats	N/A	There are no priority habitats within the ZoI of the scheme.	N/A
Bats	Unlikely	Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	Badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within ZoI of the proposed works during the survey. Similar suitable habitats are widely present in the surrounding area and thus small loss of habitat will have a negligible impact.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the ZoI of the scheme	N/A
Great crested newts	N/A	No habitat suitability within the ZoI of the scheme	N/A
Otters	N/A	No habitat suitability within the ZoI of the scheme	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No habitat suitability within the ZoI of the scheme	N/A
White clawed crayfish	N/A	No habitat suitability within the ZoI of the scheme	N/A
Other notable species	Unlikely	West European Hedgehog have been previously recorded within 500m of the proposed route.	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.13 Crossing: S27 Barrels

Site location:
IP31 3RJ

Grid Reference:
03/04/16

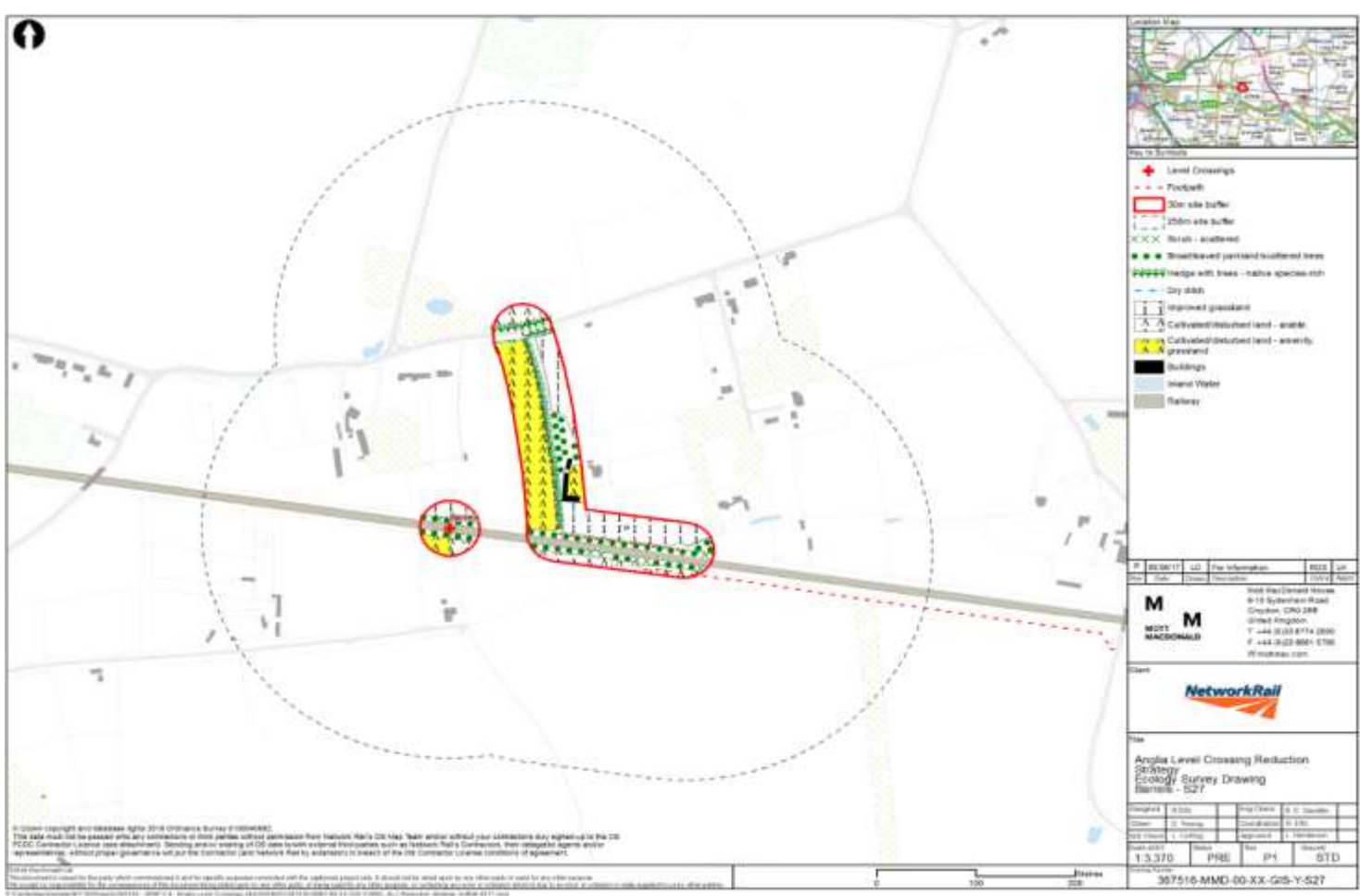
Survey Date:
03/04/16, 13/10/16 & 11/01/17

Desk Study Results

- Statutory Designated Sites
None present within 2km of the scheme.
- Non-Statutory Designated Sites
None present within 500m of the scheme.
- Waterbodies
There are six ponds within 250m of the proposed route. Two ponds located to the north west are separated from the route by Barrels Road. Two ponds are located over 95m east and separated by paddocks and amenity grassland.
- Species Records within 500m:
Aquarius paludum; ; bee orchid *Ophrys apifera*; brown hare *Lepus europaeus*; brown long-eared bat *Plecotus auritus*; bullfinch *Pyrrhula pyrrhula*; chicory *Cichorium intybus*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; common cudweed *Filago vulgaris*; common frog *Rana temporaria*; common spotted-orchid *Dactylorhiza fuchsii*; common toad *Bufo bufo*; cuckoo *Cuculus canorus*; duncock *Prunella modularis*; eastern grey squirrel *Sciurus carolinensis*; European otter *Lutra lutra*; goldcrest *Regulus regulus*; great tit *Parus major*; green woodpecker *Picus viridis*; greenfinch *Carduelis chloris*; house sparrow *Passer domesticus*; kestrel *Falco tinnunculus*; lesser spearwort *Ranunculus flammula*; linnet *Linaria cannabina*; long-horned general *Stratiomys longicornis*; marsh ragwort *Senecio aquaticus*; marsh valerian *Valeriana dioica*; pied wagtail *Motacilla alba*; pyramidal orchid *Anacamptis pyramidalis*; reed bunting *Emberiza schoeniclus*; robin *Erthacus rubecula*; skylark *Alauda arvensis*; small heath *Coenonympha pamphilus*; smooth newt *Lissotriton vulgaris*; sneezewort *Achillea ptarmica*; song thrush *Turdus philomelos*; southern marsh-orchid *Dactylorhiza praetermissa*; spiny reedtharow *Ononis spinosa*; starling *Sturnus vulgaris*; stonechat *Saxicola rubicola*; swallow *Hirundo rustica*; swift *Apus apus*; turtle dove *Streptopelia turtur*; west European hedgehog *Erinaceus europaeus*; white admiral *limenitis camilla*; wild pansy *Viola tricolor*; wren *Troglodytes troglodytes*; yellowhammer *Emberiza citrinella*.

Survey Results

- The field surveys undertaken identified the following habitat types: Arable, amenity grassland, dry ditch, hedgerows, improved grassland and scattered semi-mature trees. There was no access to the railway embankment of semi-mature trees and scattered scrub.
- The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. No access along railway embankment. Further survey required. Notable features present were as follows:
- Bats: The hedgerow, scattered semi-mature trees and railway embankment along the proposed route have potential to support foraging/commuting activity by bats.
 - Badgers: Suitable habitat for badgers along proposed route. No badger field signs identified within Zol of the proposed works during the survey.
 - Birds: There is potential for breeding birds along the proposed route.
 - Great crested newts: There is potential for great crested newts within 250m of the ponds.
 - Reptiles: There is potential for reptiles within grassland and railway embankment.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	N/A	No designated site present within 2km of the proposed route.	N/A
Priority Habitats	N/A	There are no priority habitats within the Zol of the scheme.	N/A
Bats	Unlikely	Vegetation clearance along the proposed route requires the removal of 120m of semi-mature trees and scrub along the railway embankment. Vegetation to be retained to maintain connectivity of linear habitats. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	No badger field signs identified within Zol of the proposed works during the survey. Railway embankment and dry ditch provide suitable habitat for sett creation. No access to railway embankment at time of survey	F - Refer to Section 4
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme. No previous records of dormice within 500m of the proposed route.	N/A
Great crested newts	Unlikely	There are no previous records of great crested newts within 500m of the proposed route. No impact anticipated to the water bodies in the surrounding areas of the proposed route. Vegetation clearance along the proposed route will be minimal.	G
Otters	N/A	No habitat suitability within the Zol of the scheme	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No habitat suitability within the Zol of the scheme	N/A
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Evidence of rabbit found along route option. West European Hedgehog have been previously recorded within 500m of the proposed route.	J
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.14 Crossing: S28 Grove Farm

Site location:
IP31 3SF

Grid Reference:
TL 93866 64802

Survey Date:
12/04/2016 &
13/10/2016

Desk Study Results

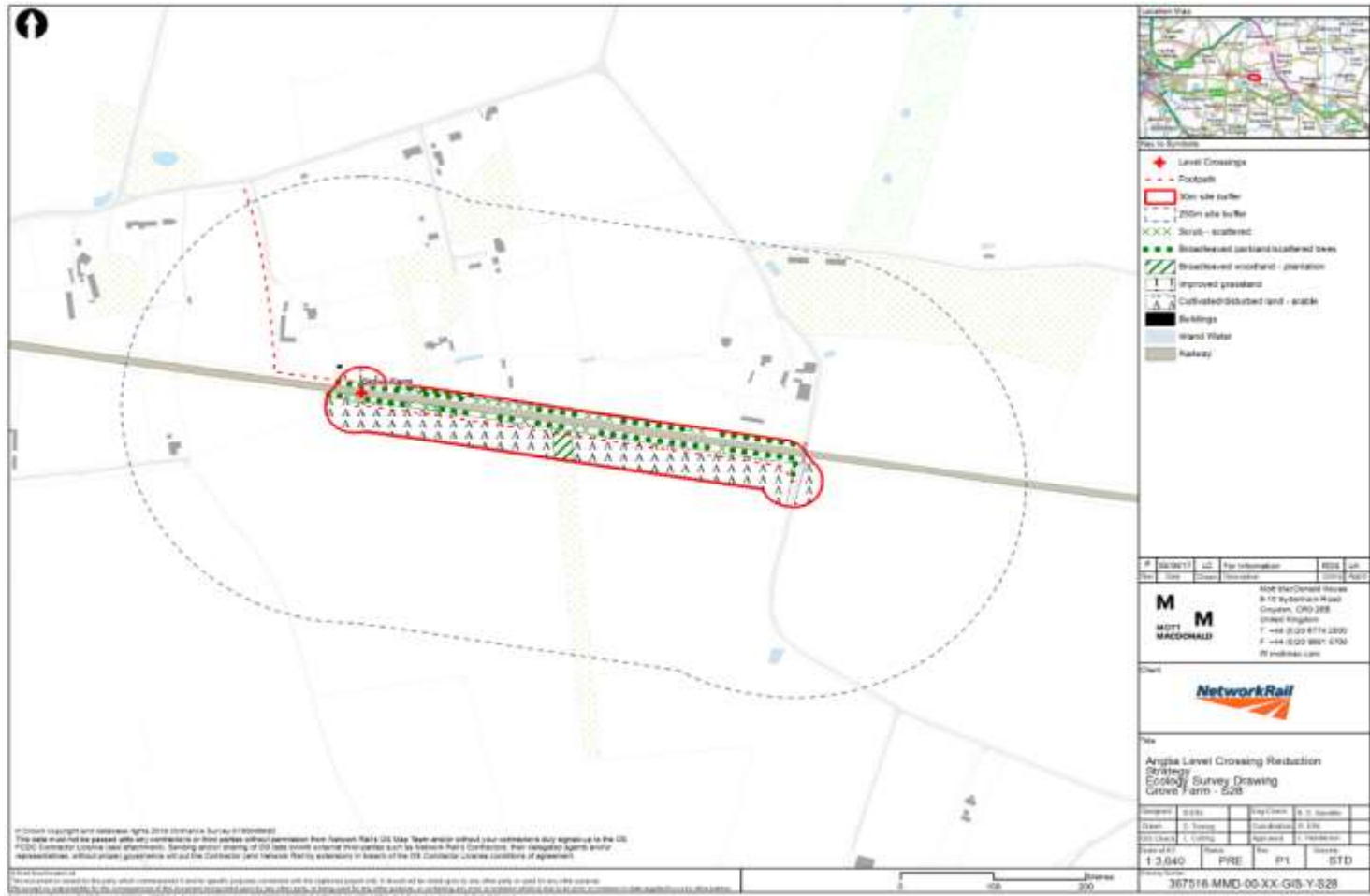
- Statutory Designated Sites
None present within 2km of the scheme.
- Non-Statutory Designated Sites
None present within 500m of the scheme.
- Waterbodies
There are six ponds within 250m of the proposed route. All ponds are located over 60m north of the railway.
- Species Records within 500m:
Aquarius paludum *Aquarius paludum*; ; bee orchid *Ophrys apifera*; brown hare *Lepus europaeus*; brown long-eared bat *Plecotus auritus*; bullfinch *Pyrrhula pyrrhula*; chicory *Cichorium intybus*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; common cudweed *Filago vulgaris*; common frog *Rana temporaria*; common spotted-orchid *Dactylorhiza fuchsii*; common toad *Bufo bufo*; cuckoo *Cuculus canorus*; duncock *Prunella modularis*; eastern grey squirrel *Sciurus carolinensis*; European otter *Lutra lutra*; goldcrest *Regulus regulus*; great tit *Parus major*; green woodpecker *Picus viridis*; greenfinch *Carduelis chloris*; house sparrow *Passer domesticus*; kestrel *Falco tinnunculus*; lesser spearwort *Ranunculus flammula*; linnet *Linaria cannabina*; long-horned general *Stratiomys longicornis*; marsh ragwort *Senecio aquaticus*; marsh valerian *Valeriana dioica*; pied wagtail *Motacilla alba*; pyramidal orchid *Anacamptis pyramidalis*; reed bunting *Emberiza schoeniclus*; robin *Erthacus rubecula*; skylark *Alauda arvensis*; small heath *Coenonympha pamphilus*; smooth newt *Lissotriton vulgaris*; sneezewort *Achillea ptarmica*; song thrush *Turdus philomelos*; southern marsh-orchid *Dactylorhiza praetermissa*; spiny restharrow *Ononis spinosa*; starling *Sturnus vulgaris*; stonechat *Saxicola rubicola*; swallow *Hirundo rustica*; swift *Apus apus*; turtle dove *Streptopelia turtur*; west European hedgehog *Erinaceus europaeus*; white admiral *limenitis camilla*; wild pansy *Viola tricolor*; wren *Troglodytes troglodytes*; yellowhammer *Emberiza citrinella*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable, improved grassland, broadleaved woodland, scrub, line of immature alder, mature trees.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bats: The hedgerow and immature trees along the proposed route have potential to support foraging/commuting activity by bats.
- Badgers: Suitable habitat for badgers along accessible areas along the proposed route. No badger field signs identified within Zol of the proposed works during the survey.
- Birds: There is potential for breeding birds within scrub and trees along the proposed route.
- Great crested newts: There is potential for great crested newts within 250m of the ponds
- Reptiles: There is potential for reptiles within grassland and scrub along the proposed route.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	N/A	No designated site present within 2km of the proposed route.	N/A
Priority Habitats	Extremely unlikely	There are no priority habitats within the Zol of the scheme.	N/A
Bats	Unlikely	Vegetation clearance along the proposed route requires a 2m cut through of immature alder trees. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	No badgers have been previously recorded within 500m of the proposed route. Dry ditch requires steps to connect proposed route with existing footpath over bridge. This area provides suitable habitat for sett creation and foraging however, similar habitats are widely present in the surrounding area and thus small loss of habitat will have a negligible impact.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme.	N/A
Great crested newts	Unlikely	There are no previous records of great crested newts within 500m of the proposed route. No impact anticipated to the water bodies in the surrounding areas of the proposed route. Vegetation clearance along the proposed route will be minimal.	G
Otters	Unlikely	Otters have been previously recorded within 500m of the proposed route. No habitat suitability within the Zol of the scheme. If present, no long-term loss of large areas of suitable otter habitat. No permanent or temporary habitat fragmentation. No impact anticipated to the water bodies within the Zol of the scheme.	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No habitat suitability within the Zol of the scheme	N/A
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Evidence of rabbit found along route option. West European Hedgehog have been previously recorded within 500m of the proposed route.	J
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.15 Crossing: S29 Hawk End Lane

Site location:
IP30 9ED

Grid Reference:
TL 98742 64060

Survey Date:
12/04/2016

Desk Study Results

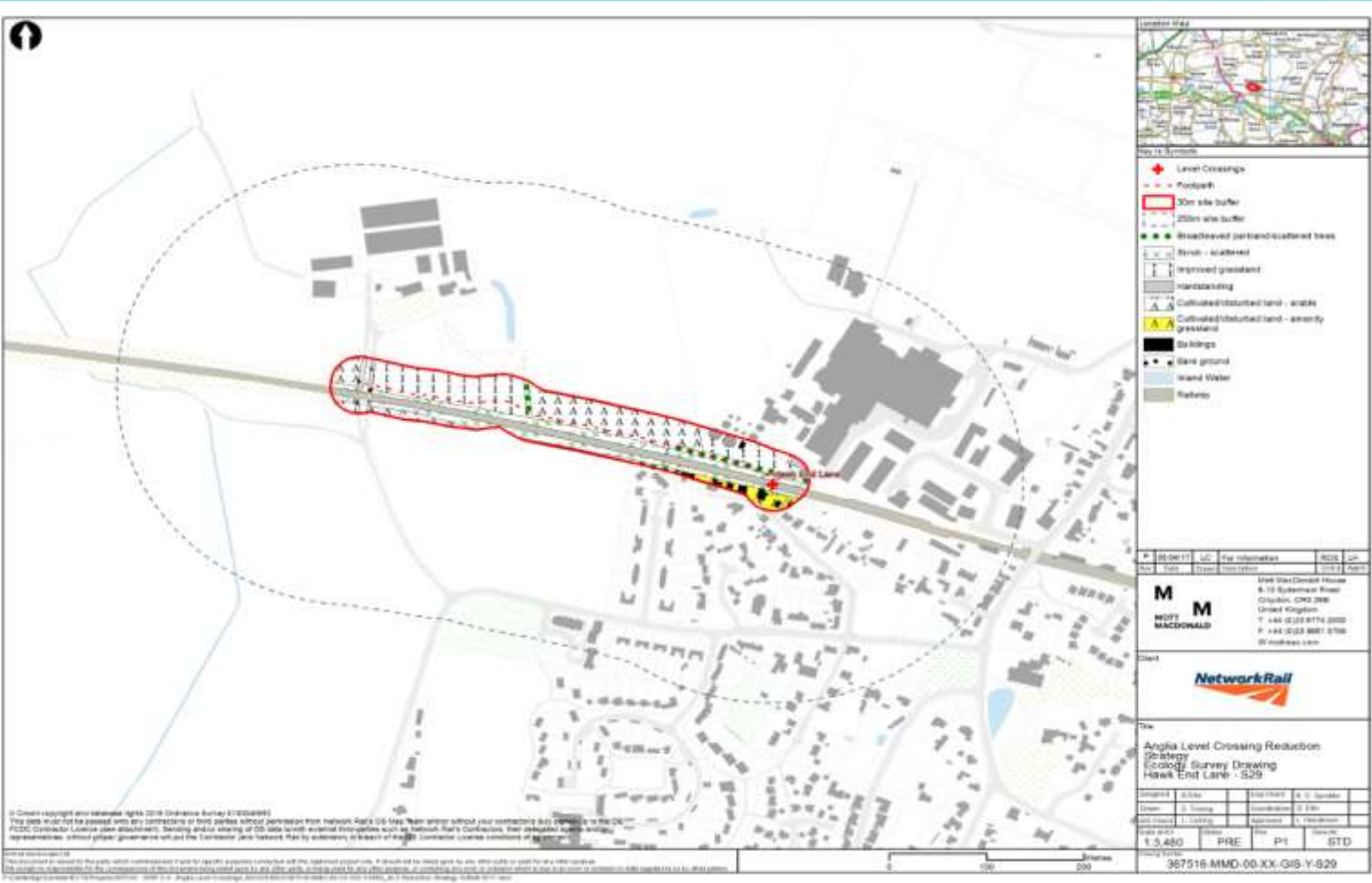
- Statutory Designated Sites
Norton Woods SSSI is an ancient woodland site located 930m west along the railway from the proposed route. Much of the wood is acid pedunculate oak, hazel and ash with abundant birch. There are also areas of wet ash, maple, pedunculate oak and hornbeam.
- Non-Statutory Designated Sites
None present within 500m of the scheme.
- Waterbodies
There is a moat and a drainage ditch within 250m of the proposed route. The moat is located 82m north and the ditch is located 160m south west of the proposed route.
- Species Records within 500m:
Coal tit *Parus ater*; collared dove *Streptopelia decaocto*; common pipistrelle *Pipistrellus pipistellus*; dunnoek *Prunella modularis*; goldfinch *Carduelis carduelis*; great crested newt *Triturus cristatus*; great tit *Parus major*; greenfinch *Carduelis chloris*; house sparrow *Passer domesticus*; robin *Erthacus rubecula*; song thrush *Turdus philomelos*; starling *Sturnus vulgaris*; west European hedgehog *Erinaceus europaeus*; wren *Troglodytes troglodytes*.

Survey Results

The field surveys undertaken identified the following habitat types: Urban area of hardstanding, bare ground, buildings and amenity grassland, improved grassland, arable, parkland scattered trees. Scattered trees and scrub along the railway corridor.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bats: The parkland scattered trees along the proposed route have potential to support foraging/commuting activity by bats.
- Badgers: Suitable habitat for badgers along proposed route. No badger field signs identified within ZoI of the proposed works during the survey.
- Birds: There is potential for breeding birds in areas of scrub and trees.
- Great crested newts: There is potential for great crested newts within 250m of the waterbodies.
- Reptiles: There is potential for reptiles within grassland and scrub.
- Water voles: There is potential for water voles within the drainage ditch.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	Unlikely	No impact anticipated to Norton Woods SSSI. Scattered trees and scrub along the railway connect the proposed route and the SSSI.	N/A
Priority Habitats	Likely	No impacts anticipated to the water bodies or ancient woodland within the ZoI fo the scheme.	N/A
Bats	Unlikely	Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No loss of trees anticipated. No additional lighting proposed.	N/A
Badgers	Unlikely	No badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within ZoI of the proposed works during the survey. The proposed route would not result in the loss of suitable foraging habitat.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the ZoI of the scheme	N/A
Great crested newts	Unlilely	Great crested newts have been previously recorded within 500m of the proposed route. No impact anticipated to the water bodies in the surrounding areas of the proposed route. No crossings required. Vegetation clearance along the proposed route will be minimal.	G
Otters	N/A	Drainage ditch located 160m south west of the proposed route does not provide suitable habitat for otters. No otters have been recorded within 500m from the proposed route.	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No water voles have been recorded within 500m from the proposed route. Proposed route does not require crossing ditch.	N/A
White clawed crayfish	N/A	No habitat suitability within the ZoI of the scheme	N/A
Other notable species	Unlikely	Evidence of rabbit found along route option. West European Hedgehog have been previously recorded within 500m of the proposed route.	J
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.16 Crossing: S30 Lords No29

Site location:
IP30 9UD

Grid Reference:
TL 99892 63778

Survey Date:
12/04/2016

Desk Study Results

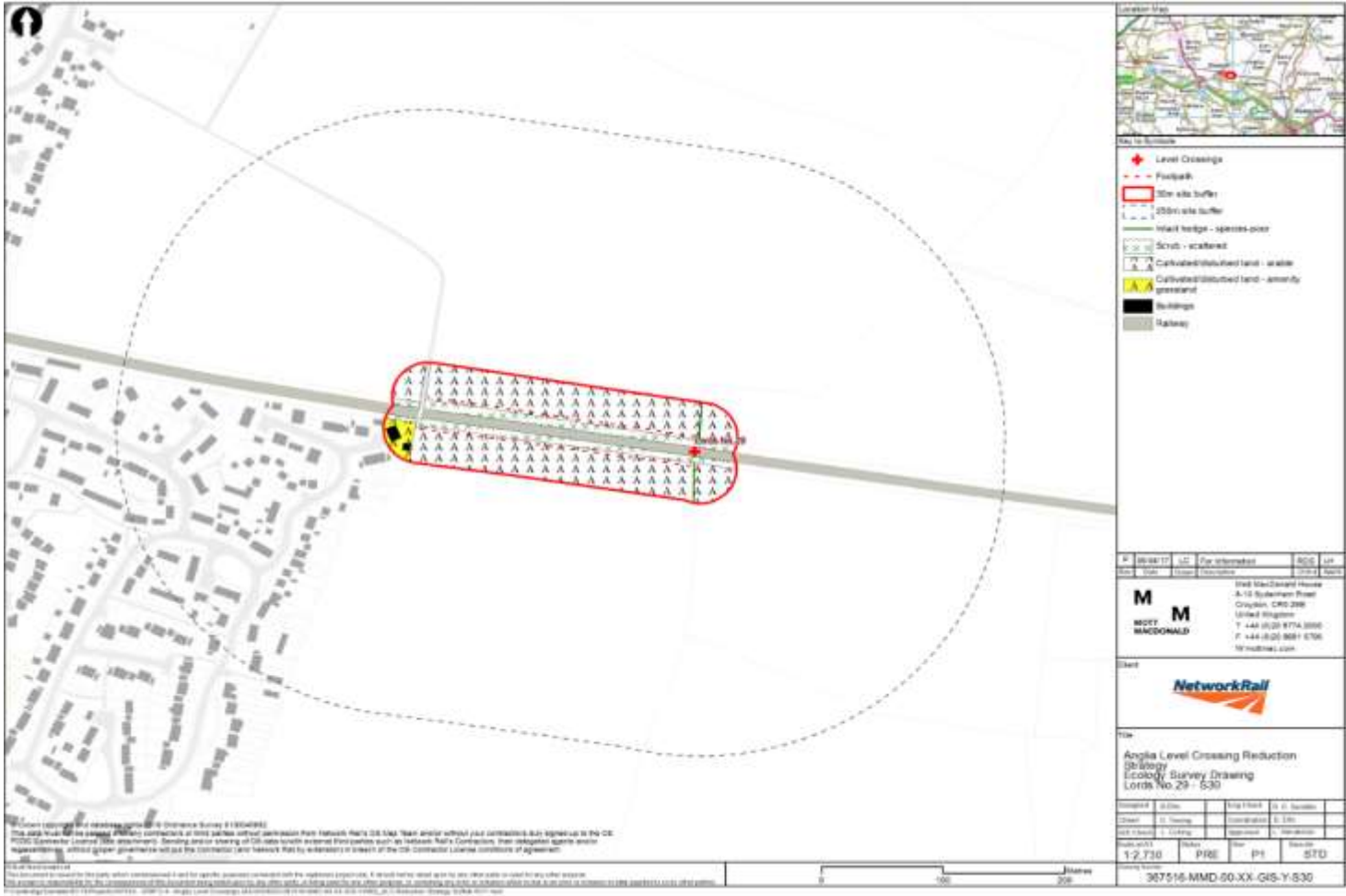
- Statutory Designated Sites
None present within 2km of the scheme.
- Non-Statutory Designated Sites
None present within 500m of the scheme.
- Waterbodies
One drainage ditch is located 120m north of the proposed route separated by an arable field.
- Species Records within 500m:
Black poplar *Populus nigra betulifolia*; bullfinch *Pyrrhula pyrrhula*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; dunnoek *Prunella modularis*; European ash *Fraxinus excelsior*; goldfinch *Carduelis carduelis*; great tit *Parus major*; greenfinch *Carduelis chloris*; house sparrow *Passer domesticus*; robin *Erthacus rubecula*; small heath *Coenonympha pamphilus*; starling *Sturnus vulgaris*; west European hedgehog *Erinaceus europaeus*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable and amenity grassland, buildings, scattered scrub and hedgerow.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bats: There is potential commuting and foraging habitat along the proposed route.
- Badgers: Suitable foraging habitat for badgers along proposed route. No badger field signs identified within ZoI of the proposed works during the survey.
- Birds: There is potential for breeding birds in areas of scrub.
- Reptiles: There is potential for reptiles within grassland and scrub.
- Water voles: There is potential for water voles within the drainage ditch.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	N/A	No designated sites present within 2km of the scheme.	N/A
Priority Habitats	N/A	No impact anticipated to the water bodies within the ZoI of the scheme.	N/A
Bats	Extremely unlikely	Vegetation clearance along the proposed route will be minimal as it makes use of arable field margins and existing footbridge over railway. No additional lighting proposed.	N/A
Badgers	Unlikely	No badgers have been previously recorded within 500m of the proposed route. No previous records of badgers within 500m of the proposed route. The proposed route would not result in the loss of suitable foraging habitat.	F
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the ZoI of the scheme	N/A
Great crested newts	N/A	Drainage ditch located 120m north of the proposed route does not provide suitable habitat for great crested newts. No great crested newts have been recorded within 500m from the proposed route.	N/A
Otters	N/A	Drainage ditch located 120m north of the proposed route does not provide suitable habitat for otters. No otters have been recorded within 500m from the proposed route.	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No water voles have been recorded within 500m from the proposed route. Proposed route does not require crossing ditch.	N/A
White clawed crayfish	N/A	Proposed route does not require crossing ditch.	N/A
Other notable species	Unlikely	West European Hedgehog have been previously recorded within 500m of the proposed route.	N/A
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.17 Crossing: S31 Mutton Hall

Site location:
IP14 3LR

Grid Reference:
TL 01179 63597

Survey Date:
12/04/2016 &
28/09/16

Desk Study Results

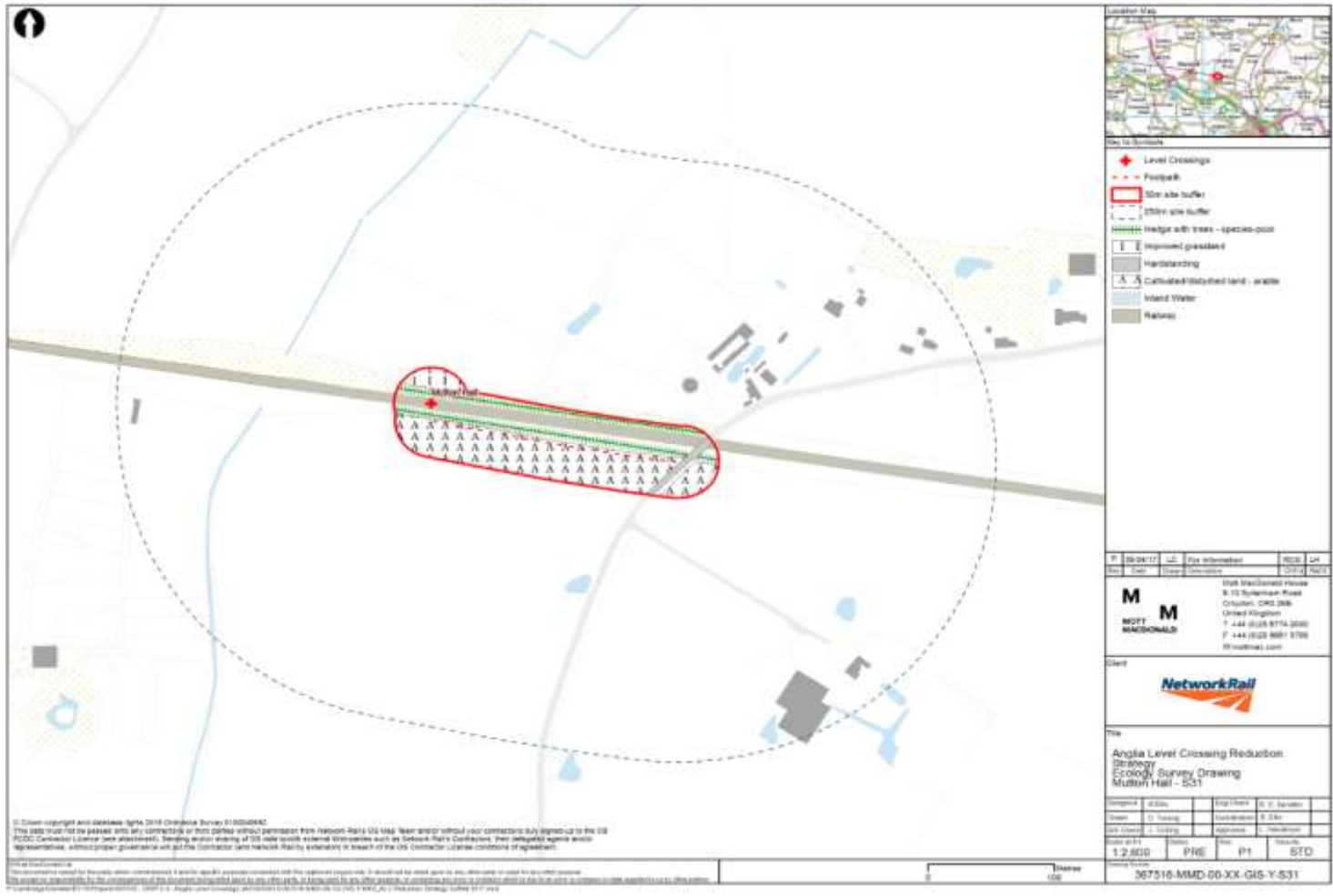
- Statutory Designated Sites
None present within 2km of the scheme.
- Non-Statutory Designated Sites
None present within 500m of the scheme.
- Waterbodies
There are eight ponds within 250m of the proposed route. One ditch is located 130m west of the proposed works and is culverted under the railway.
- Species Records within 500m:
European ash *Fraxinus excelsior*; English oak *Quercus robur*; field maple *Acer campestre*; slow-worm *Anguis fragilis*; west European hedgehog *Erinaceus europaeus*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable, hedgerow with trees and improved grassland. A road (hard standing) lies west of the proposed route.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bat: Mature trees in the surrounding area have potential to support roosting, foraging and commuting activity by bats. The ditch provides suitable foraging/commuting habitat for bats. No potential tree roosts identified along proposed route.
- Badgers: Suitable foraging habitat for badgers along proposed route. No badger field signs identified within Zol of the proposed works during the survey.
- Birds: There is potential for breeding birds in trees and areas of scrub along the proposed route.
- Great crested newts: There is suitable habitat for great crested newts within 250m of the route.
- Reptiles: There is potential for reptiles within grassland and scrub.
- Water voles: There is potential for water voles within the drainage ditch.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	N/A	No designated sites present within 2km of the scheme.	N/A
Priority Habitats	Extremely unlikely	No impact anticipated to the water bodies within the Zol of the proposed route.	N/A
Bats	Extremely unlikely	Vegetation clearance along the proposed route will be minimal. Proposed route makes use of arable field margins and an existing road bridge. No habitat loss anticipated for commuting and foraging bats. No removal of mature trees. No additional lighting proposed.	N/A
Badgers	Extremely unlikely	No badger field signs identified within Zol of the proposed works during additional badger surveys. No previous records of badgers within 500m of the proposed route. The proposed route would not result in the loss of suitable foraging habitat.	N/A
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme	N/A
Great crested newts	Extremely unlikely	Great crested newts have not been previously recorded within 500m of the proposed route. Vegetation clearance along the proposed route will be minimal. No impact anticipated to the water bodies in the surrounding areas of the proposed route.	G
Otters	N/A	Drainage ditch located 130m west of the proposed route does not provide suitable habitat for otters. No otters have been recorded within 500m from the proposed route.	N/A
Reptiles	Unlikely	The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	N/A	No water voles have been recorded within 500m from the proposed route. Proposed route does not require crossing ditch.	N/A
White clawed crayfish	N/A	Proposed route does not require crossing ditch.	N/A
Other notable species	Unlikely	Evidence of rabbit found along route option. West European Hedgehog have been previously recorded within 500m of the proposed route.	J
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

3.18 Crossing: S69 Bacton

Desk Study Results

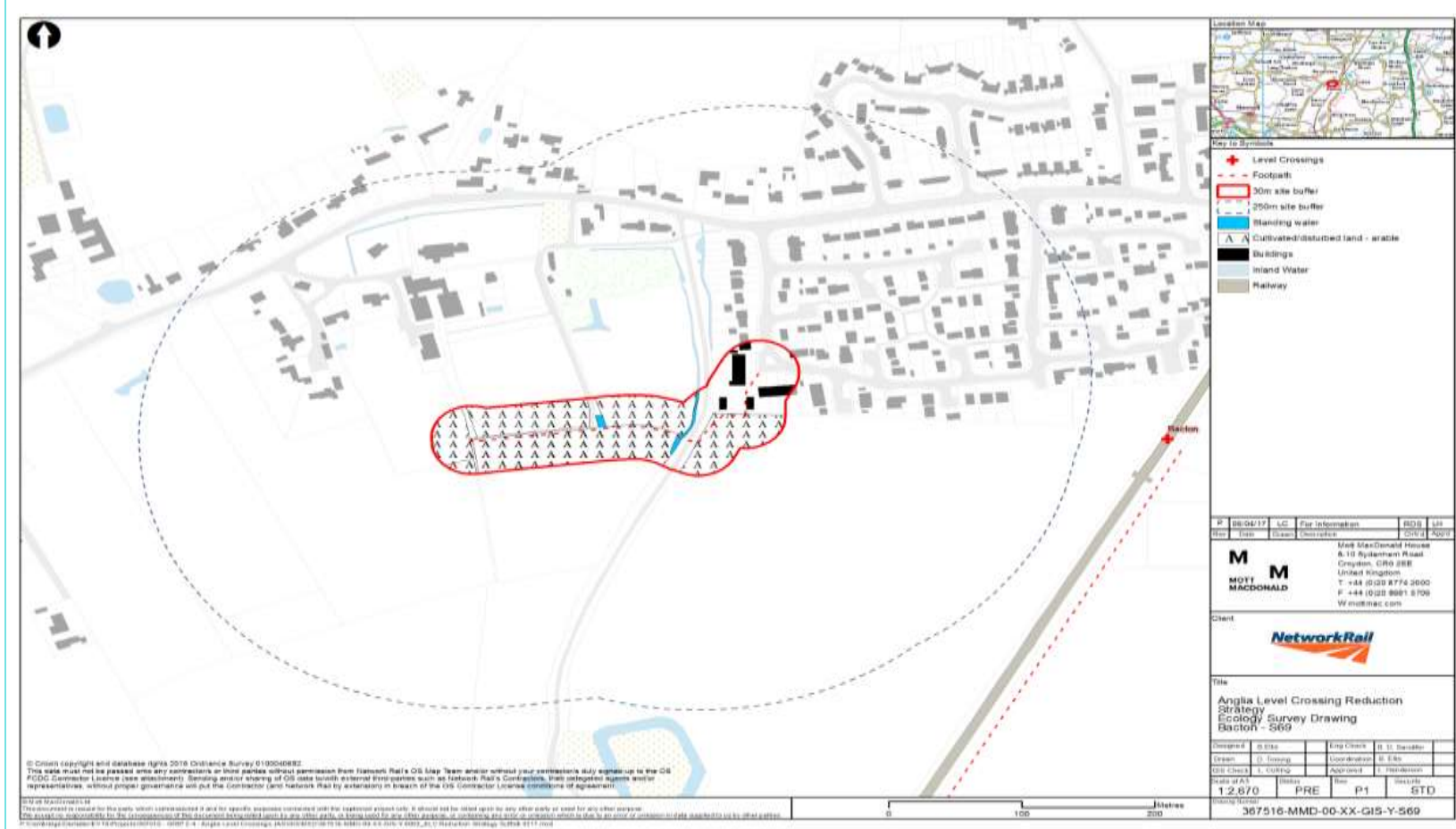
- Statutory Designated Sites
None present within 2km of the scheme.
- Non-Statutory Designated Sites
None present within 500m of the scheme.
- Waterbodies
There are nine waterbodies present within 250m of the proposed route. There is a moat 160m north west of a section of the proposed route east of the railway. There is a network of drainage ditches adjacent to the proposed route east of the railway.
- Species Records within 500m:
13-spot ladybird *Hippodamia (Hippodamia) tredecimpunctata*; brown hare *Lepus europaeus*; coal tit *Periparus ater*; collared dove *Streptopelia decaocto*; common frog *Rana temporaria*; common toad *Bufo bufo*; dunnoek *Prunella modularis*; European water vole *Arvicola amphibius*; field maple *Acer campestre*; goldfinch *Carduelis carduelis*; great spotted woodpecker *Dendrocopos major*; great tit *Parus major*; green woodpecker *Picus viridis*; greenfinch *Carduelis chloris*; house sparrow *Passer domesticus*; little owl *Athene noctua*; pied wagtail *Motacilla alba*; robin *Erthacus rubecula*; slow worm *Anguis fragilis*; song thrush *Turdus philomelos*; starling *Sturnus vulgaris*; swift *Apus apus*; turtle dove *Streptopelia turtur*; west European hedgehog *Erinaceus europaeus*; wren *Troglodytes troglodytes*.

Survey Results

The field surveys undertaken identified the following habitat types: Arable, residential properties and hardstanding, amenity grassland, drainage ditches, scattered trees, hedgerow and pond.

The likely presence or absence of protected and notable animal and plant species and habitats was assessed and likely impacts from the proposed route considered. Notable features present were as follows:

- Bats: There is suitable commuting/ foraging habitat within the areas of scrub and scattered trees along the proposed route.
- Badgers: Suitable foraging habitat for badgers along proposed route. No badger field signs identified within Zol of the proposed works during the survey.
- Birds: There is potential for breeding birds in areas of scrub and trees along the proposed route.
- Great crested newts: There is suitable habitat for great crested newts along the proposed route alignment.Otters: There is suitable habitat for otters within the moat.
- Reptiles: There is potential for reptiles within arable field margin and scrub.
- Water voles: There is potential for water voles within a ditch that requires crossing along the proposed route, directly west of the crossing. Further surveys required in 2017 to assess habitat suitability at location of water course crossing.



Ecological constraints	Adverse Impacts	Justification	KER
Designated sites	N/A	No designated sites present within 2km of the scheme.	N/A
Priority Habitats	Unlikely	No impacts anticipated to the moat or woodland. Majority of proposed route makes use of exisitng arable field margins. The construction of the footbridge would be bank to bank with no disruption of water flow.	A
Bats	Unlikely	Vegetation clearance along the proposed route will be minimal. Habitat lost will be very small in the context of the wide areas within which bats can forage and commute. No additional lighting proposed.	N/A
Badgers	Unlikely	No badgers have been previously recorded within 500m of the proposed route. No badger field signs identified within Zol of the proposed works during the survey. The proposed route would not result in the loss of suitable foraging habitat.	N/A
Breeding birds	Unlikely	Habitats present have suitability to support common species of nesting bird. Habitat loss would be small in the context of surrounding suitable habitats.	B
Dormice	N/A	No habitat suitability within the Zol of the scheme	N/A
Great crested newts	N/A	No great crested newts have been previously recorded within 500m of the proposed route. No impacts anticipated to the ponds within 250m of the proposed works. Drainage ditches and moat do not provide suitable habitat for great crested newts.	G
Otters	Unlikely	No previous records of otters within 500m of the scheme. No long-term loss of large areas of suitable otter habitat. If present, no permanent or temporary habitat fragmentation, the moat will not be obstructed during construction and otters could continue commuting along the watercourse.	E
Reptiles	Unlikely	Slow-worms have been recorded within 500m of the proposed route. The proposed works will not result in any long-term loss of large areas of suitable reptile habitat or result in permanent or temporary habitat fragmentation.	C
Water vole	Unlikely	Water voles have been recorded within 500m of the proposed route. If present, the proposed works would have a low impact on this species. Any loss of foraging habitat will be temporary and the area very small in the context of the surrounding habitats. Works will not result in any long-term loss of large areas of suitable water vole habitat or result in permanent or temporary habitat fragmentation.	D – Refer to Section 4
White clawed crayfish	N/A	No habitat suitability within the Zol of the scheme	N/A
Other notable species	Unlikely	Evidence of rabbit found along route option. West European Hedgehog have been previously recorded within 500m of the proposed route. .	J
Invasive plant species	N/A	No previous records within 500m of the proposed route. None found at the time of survey.	N/A

4 Additional Survey Requirements

The table below provides a summary of additional survey requirements for the scheme.

Results of these surveys will be issued as an addendum to this report.

Table 4: Further Survey and Mitigation Requirements: Suffolk

Ecological Feature	Survey Requirements	Timings
Statutory Designated Sites	No further survey required	N/A
Priority Habitats	Application of precautionary methods during construction	Construction
Watercourses:	All site clearance and construction works near are undertaken with regard to the Pollution Prevention Guidelines (PPGs) and CIRIA.	Construction
Bats	No further survey required	N/A
Badger	S27: Preconstruction check	Preconstruction: optimal time spring/autumn
Otter	S03 - Further survey required to inform mitigation and licensing requirements Survey and mitigation to follow Natural England guidance (Natural England, 2014)	Preconstruction: Any time of year, though winter is optimal when obscuring vegetation is no longer present
Water vole	S01, S13, S24, S69 - Water vole presence/absence survey required. Surveys to follow best practice (Dean et al, 2016)	Preconstruction: Survey period mid-April to late September.
White clawed crayfish	No further survey required	N/A
Birds	Application of precautionary methods during construction S01 – If habitats suitable for Cetti's warbler need to be removed during the breeding bird season a breeding bird survey would required. Field methods should be based on the British Trust for Ornithology's Common Bird Census (Marchant, 1983) with the number of visits undertaken in accordance with Scottish Natural Heritage (2005; 2009)	Preconstruction Preconstruction: minimum of three visits (end March-June) undertaken at monthly intervals
Reptiles	Application of precautionary methods during construction	Construction
Hazel Dormouse	S04, S05: Assessment of suitability of habitats to be affected by proposals to support dormice required to inform further survey and mitigation requirements	Preconstruction: Survey period April to November.
Invasive Species	Preconstruction check	Preconstruction
Other notable species	Preconstruction check	Preconstruction

Ecological Feature	Survey Requirements	Timings
All	<p>Due to the mobility of animals and the potential for colonisation of habitats, it is recommended that an updated ecological survey be undertaken prior to the works should this not occur within 12 months of the date of this assessment.</p> <p>A preconstruction walkover survey would be undertaken of each proposed route option to confirm baseline conditions and refine requirements for mitigation during works.</p>	Preconstruction

Source: Mott MacDonald

5 Biodiversity Enhancements

Following the principles of British Standard 4020:2013. Biodiversity – Code of practice for planning and development 42020:2013, the following enhancement opportunities should be considered during the development of the CEMP:

- Incorporation of bird and bat boxes along retained habitats adjacent to proposed routes, where possible;
- Reuse of cut vegetation (dense scrub) to create habitat suitable for reptile species/great crested newts/terrestrial invertebrates;
- Retain as much dead wood (logs and stumps) as possible under shade and leave windblown trees in situ, except where they pose a safety risk, to create habitat for stag beetles; and
- Provide nesting sites for hedgehogs by creating refuge opportunities: leave logs and leaf piles in undisturbed areas and install hedgehog boxes; improve connectivity – cut c.13cm² holes in fences or dig a channel beneath garden boundaries to aid connectivity; enhance foraging habitat – create habitat with a variety of plants to attract natural hedgehog food (beetles, caterpillars and earthworms).

6 References

Bright, P., Morris, P. and Mitchell-Jones, T. (2006). The dormouse conservation handbook. Second edition. Published by English Nature.

British Standards Institution (2013). BS42020. Biodiversity - Code of practice for planning and development. The British Standards Institution.

British Standards Institution Standards Publication. (2014). BS8596. Surveying for bats in trees and woodland. Trees in relation to design, demolition and construction – Recommendations BS 5837:2012. The British Standards Institution

Chartered Institute of Ecology and Environmental Management (CIEEM) (2013). Guidelines for Preliminary Ecological Appraisal. Online at http://www.cieem.net/data/files/Resource_Library/Technical_Guidance_Series/GPEA/GPEA_April_2013.pdf (Accessed January 2017).

Chartered Institute of Ecology and Environmental Management (2016). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. 2nd Edition. Online at http://www.cieem.net/data/files/Publications/EcIA_Guidelines_Terrestrial_Freshwater_and_Coastal_Jan_2016.pdf (Accessed January 2017)

Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition. Bat Conservation Trust; London.

Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds. Fiona Mathews and Paul Chanin. The Mammal Society, London.

DEFRA (2003). Pollution Prevention and Control (England and Wales) Regulations (as amended). Online at: <http://adlib.everysite.co.uk/adlib/defra/content.aspx?id=000IL3890W.184SZKQD6G86AQ> (Accessed January 2017)

Joint Nature Conservation Council (JNCC) (2010). Handbook for Phase 1 habitat survey – A technique for environmental audit. JNCC; Peterborough UK Protected Sites website. <http://jncc.defra.gov.uk/page-4> (Accessed January 2017)

Joint Nature Conservation Council (JNCC) (2017) Website: <http://jncc.defra.gov.uk/default.aspx?page=5281> (Accessed January 2017)

Marchant, J.H., 1983. Common Birds Census Instructions. Tring: British Trust for Ornithology.

Mott MacDonald (January, 2017a) Anglia Level Crossing Reduction Strategy, Suffolk Habitats Regulations Assessment Task 1 Screening, 367516/RPT192 Revision A (January, 2017)

Mott MacDonald (January, 2017b) Anglia Level Crossing Reduction Strategy, Suffolk Environmental Appraisal and Action Plan, 367516/RPT190 Revision A (January, 2017)

Multi-Agency Geographic Information for the Countryside (MAGIC) website: <http://magic.defra.gov.uk/> (Accessed January 2017).

Multi-Agency Geographic Information for the Countryside (MAGIC) (2016). Natural England's Impact Risk Zones for Sites of Special Scientific Interest. For use by Local Planning Authorities

to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites and determine when to consult Natural England. Access Online here:

http://www.magic.gov.uk/Metadata_for_magic/SSSI%20IRZ%20User%20Guidance%20v2.5%20MAGIC%2010Mar2016.pdf.

Natural England, (2014). Otters: surveys and mitigation for development projects. Accessed online here: <https://www.gov.uk/guidance/otters-protection-surveys-and-licences>. (Accessed January 2017).

Scottish Natural Heritage, (2005). Survey methods for use in assessing the impacts of onshore windfarms on bird communities. [pdf] Available at: http://www.snh.org.uk/pdfs/strategy/renewable/bird_survey.pdf [Accessed on 18 January 2017].

Scottish Natural Heritage, (2014). Recommended bird survey methods to inform impact assessment of onshore wind farms. [pdf] Available at: <http://www.snh.gov.uk/docs/C278917.pdf> [Accessed on 18 January 2017].

A. Species Specific Legislation

The following information in this section relates to species assessed within this document as being potentially affected by the development and is a summary version of the full legislative text only. The relevant acts referred to in this section should be referred to for the full legislative text.

A.1 Birds

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended), which prohibits the intentional killing, injuring or taking of any wild bird (and) the taking, damaging or destroying eggs or of the nest (whilst being built or in use).

Schedule 1 bird species are afforded greater protection under the Wildlife and Countryside Act 1981 (as amended). In addition it is an offence to disturb Schedule 1 birds at or near the nest or the dependant young of Schedule 1 birds.

A.2 Bats

All bat species are protected under the Conservation of Habitat and Species Regulations 2012 (as amended) and the Wildlife and Countryside Act 1981 (as amended). This means it is illegal to intentionally or deliberately kill, injure, disturb or capture these species or damage, destroy or obstruct access to any structure, breeding or resting place used by them. Seven species are also listed on Section 41 of the NERC Act 2006.

A.3 Badgers

Badgers and their setts are afforded protection under the Protection of Badgers Act 1992. Under this act it is an offence to capture, kill, injure and cruelly or ill-treat a badger. It is also an offence to interfere with their setts without the appropriate derogation licence.

A.4 Reptiles

Reptiles have varying degrees of protection under the Wildlife and Countryside Act 1981 (as amended). The common species of reptiles are protected under Schedule 5. This means it is prohibited to intentionally kill, injure or trade the common lizard *Lacerta vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix natrix* and adder *Vipera berus*.

A.5 Great Crested Newts and other Amphibians

Great crested newts *Triturus cristatus* are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2012 (as amended); capturing, disturbing, injuring and killing newts is prohibited, as is damaging or destroying their breeding sites and resting places. Great crested newts are also listed under Section 41 of the NERC Act (2006).

Common toads are listed on Section 41 of the Wildlife and Countryside Act 1981 (as amended).

A.6 Other Mammals

Otters and water vole are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are priority species listed on Section 41 of the NERC Act 2006. Otter are also a European Protected Species.

Hedgehogs are listed on Section 41 of the NERC Act 2006.

All wild mammals are also protected from intentional inhumane treatment under the Wild Mammals (Protection) Act (1996).

A.7 White-clawed Crayfish

White-clawed crayfish are listed on Section 41 of the NERC Act 2006. They are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

A.8 Invasive, non-native species

It is an offence to plant or otherwise cause to grow in the wild invasive non-native plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

