MOTT MACDONALD

Anglia Level Crossing Reduction Strategy - Essex and Others

Precautionary Method of Works: Legally Protected Species

December 2017

Network Rail

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Contents

Executive summary

These precautionary methods were produced by Mott MacDonald for Network Rail for the specific purpose of the Anglia Level Crossing Reduction Strategy: The Essex and Others Level Crossing Reduction Order (Essex and Others Order).

This report covers precautionary methods in relation to designated sites and habitats of principal importance (HPIs) (Section 41 of the NERC Act 2006), European badgers *Meles meles*, bats, breeding birds, great crested newt *Triturus cristatus*, hazel dormouse *Muscardinus avellanarius*, European otter *Lutra lutra*, European water vole *Arvicola amphibius*, common species of reptile, white-clawed crayfish *Austropotamobius pallipes* and non-native invasive species (signal crayfish *Pacifastacus leniusculus*, Turkish crayfish *Astacus leptodactylus*, Indian balsam *Impatiens glandulifera*, Japanese knotweed *Fallopia japonica* and floating pennywort *Hydrocotyle ranunculoides*). The non-native invasive species listed above were found during desk top review undertaken as part of the Anglia Level Crossing Reduction Strategy Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017). None were recorded during the field surveys.

Section 5 of this document includes recommendations for further surveys to inform mitigation and licensing requirements for HPIs, badger, bats, breeding birds, hazel dormouse, otter and water vole. Section 5 also identifies crossings where access has been previously refused, areas were inaccessible due to dense vegetation and where surveys are required due to changes in the proposed route. These sections of the precautionary methods should be updated once surveys are complete.

1 Introduction

Mott MacDonald Limited was commissioned by Network Rail to produce a Precautionary Method Statement in relation to legally protected species with potential to be affected by the proposed closure of, and/or changes to rights at 61 level crossings (hereafter known as the Scheme). These crossings are located on railway lines within the counties of Essex and Hertfordshire, the unitary authorities of Thurrock and Southend-on-Sea and the London Borough of Havering.

The ecological features covered in this report are designated sites and habitats of principal importance (HPIs) (Section 41 of the NERC Act 2006), European badger *Meles meles*, bats, breeding birds, great crested newt *Triturus cristatus*, hazel dormouse *Muscardinus avellanarius*, European otter *Lutra lutra*, European water vole *Arvicola amphibius*, common species of reptile, white-clawed crayfish *Austropotamobius pallipes* and non-native invasive plant species (Indian balsam *Impatiens glandulifera*, Japanese knotweed *Fallopia japonica* and floating pennywort *Hydrocotyle ranunculoides*).

Sites of Special Scientific Interest (SSSI) are protected under the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2000 (in England and Wales) from certain activities that may be damaging the features of interest. Local Wildlife Sites (LoWS) are designated by local authorities and are a material consideration when planning applications are being determined. The Hedgerows Regulations (1997) protect countryside hedgerows by allowing the Planning Authority to control their removal.

All species of bats found in the UK, great crested newt, hazel dormouse and otter are fully protected as European Protected Species (EPS) under the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012). These species, together with water vole, common species of reptile, breeding birds and white-clawed crayfish, are protected under the Wildlife and Countryside Act 1981 (as amended). Badgers are protected under the Protection of Badgers Act 1992. Non-native invasive animal species (signal crayfish and Turkish crayfish) are listed under Schedule 9 Part 1 of the Wildlife and Countryside Act 1981 (as amended) and it is an offence to release, or allow the escape of alien species. Non-native invasive plant species (Indian balsam, Japanese knotweed and Floating Pennywort) are listed under Schedule 9 Part 2 of the Wildlife and Countryside Act 1981 (as amended) and it is illegal to plant or otherwise cause these species to grow in the wild.

The legislation relating to the protected species and non-native invasive species found or considered likely to be present within the Scheme is summarised in Appendix A.

For EPS species subject to the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012), Natural England's guidance (2013) is that:

> *"If the consultant ecologist, on the basis of survey information and specialist knowledge of the species concerned, considers that on balance the proposed activity is reasonably unlikely to result in an offence under Regulation 41 or 45 then no licence is required"*

A range of factors are taken into consideration when assessing whether works can proceed in the absence of a licence including the scope of works, evidence of such species and proximity of existing known populations. In cases where a licence is not required, Natural England advise that reasonable precautions be taken to avoid affecting EPS during works and that an audit trail is kept of this decision (Natural England, 2013).

This report acts as an audit trail for the decision-making process. Based on the current conditions of each level crossing included within the Scheme and the nature of the proposed works. As long as the methods of working outlined in this document are implemented in full, the proposed works would not result in a breach of the above legislation and no further detailed mitigation, such as the need for a protected species mitigation licence, is required to proceed with the works.

Should the Scheme conditions differ from those detailed below in Section 2 either prior to or during the proposed works, further mitigation may be required. Specialist ecological advice should be sought should this situation arise.

This excludes those sections of proposed new footpaths which have not been surveyed or where detailed further survey is required (e.g. National Vegetation Classification (NVC), hedgerow survey, ground level tree assessment). In these instances, further surveys are required to inform mitigation requirements. This report will need to be updated once baseline conditions have been fully assessment prior to works (see Section 5).

Potential risk to legally protected species and habitats as a result of the Scheme will also 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. These precautionary methods have been produced in line with the objectives set out by the CR-E and provides the methodology to be carried out on site during works.

2 Background

2.1 The Project

Network Rail's Anglia Level Crossing Reduction Strategy aims to reduce the risk that level crossings pose. The proposal aims to manage the possible closure or change of use of around 130 level crossings in Anglia across Cambridgeshire, Suffolk, Essex, Havering, Hertfordshire, Southend and Thurrock. Of these crossings, 61 are located within the counties of Essex and Hertfordshire, the unitary authorities of Thurrock and Southend-on-Sea and the London Borough of Havering. These are contained in the draft Essex and Others Level Crossing Reduction Order (Essex and Others Order) which is part of the wider Anglia Level Crossing Reduction Strategy.

2.2 The Proposed Works

Outlined below are the works categories assigned to each crossing as defined in The Network Rail (Essex And Others Level Crossing Reduction Order) Design Guide NR12-ECC (Network Rail, 2017).

- 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.

Installation of fencing within Network Rail land is required at the majority of level crossings to prevent trespass onto the railway.

2.3 Summary of Ecological Surveys

Mott MacDonald was commissioned by Network Rail to undertake an ecological appraisal to inform 61 level crossings included in the Essex and Others Order. Crossings were scoped in where the proposed works would result in potential direct or indirect impacts on adjacent habitats based on the category of works and a desk top review of potential ecological constraints. Following the screening exercise, 41 level crossings were scoped in for an

ecological appraisal. Field surveys were conducted between April 2016 and September 2017 where access was available. All ecological features that occur within the 30m Zone of Influence (ZoI) of each crossing in the Scheme was investigated. The ZoI is an area defined by the assessment in which there may be ecological receptors subject to impacts and subsequent effects as a result of the Scheme.

Full details of the ecology field surveys completed between April 2016 and January 2017 at the level crossings scoped in for an ecological appraisal are found in the Anglia Level Crossing Reduction Strategy Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017).

Additional protected species surveys and botanical surveys recommended within the constraints report were completed at crossings E02, E45, and E57, between July and September 2017, where access allowed. The results of these surveys are considered within this report.

Consultation with Natural England is ongoing to inform proposals at E02, E30, H05, H06 and H09. The proposed routes associated with these crossings either cross through or adjacent to Statutory Designated Sites (Sites of Special Scientific Interest; SSSI). The proposed route of new sections of footpath will cross through non-statutory designated sites (Local Wildlife Site (LoWS)) at E33, E42, E57, T05, HA4, H05, H06 and H09. LoWS or Sites of Importance for Nature Conservation (SINCS) also lie immediately adjacent to E02, E04, E09, E19 and H04. Consultation with the relevant county ecologists/ Wildlife Trusts is ongoing.

These precautionary methods cover those legally protected species potentially affected by the proposed closure of, and/or changes to rights at 41 level crossings on railway lines within Essex and others.

2.3.1 Work activities covered in this Precautionary Method Statement

The report covers works which are anticipated to commence during Spring 2018. It covers the following programmes of work:

- Removal of some existing level crossing infrastructure and installation of fencing within Network Rail land;
- Removal/trimming of trees/ vegetation for diversions to new or enhanced infrastructure (such as new footpaths, steps, bridleways, circular routes, bridges etc.);
- Ground disturbance for footbridges and culverts;
- Clearance of vegetation for access tracks and grade-separated access;
- Removal/trimming of vegetation for changes to signage; and
- Access points;

The specific works proposed for each level crossing are outlined within the Essex and Others Order and not all of the works outlined above will occur at each crossing. No other works within Essex and others will be undertaken as part of the Essex and Others Order. Any activity subsequently programmed that is not as detailed within the Order documents, will require assessing by a suitably experienced ecologist to establish whether any further precautionary mitigation measures are required.

2.4 Scope of the Precautionary Method Statement

The precautionary methods detailed within this report have considered the scope and localised, small scale works associated with the proposed closure of, and/or changes to rights at the 41 crossings and assesses how those works could potentially affect badgers, bats, breeding birds, great crested newt, hazel dormouse, otter, water vole, common species of reptile, white-clawed

crayfish and non-native invasive plant species (Indian balsam, Japanese knotweed and floating pennywort) within the ZoI of the works.

Full details of the ecological assessment and ecological constraints associated with work at each crossing is found in the Anglia Level Crossing Reduction Strategy Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017).

Section 3 of this report includes the rationale as to why the proposed works are considered unlikely to lead to an offence being committed in relation to protected species associated with the Scheme and why a protected species mitigation licence may or may not be required, where the baseline currently allows.

Section 4 of this report includes both general and species-specific measures to be employed by the Network Rail for minimising impacts to wildlife during the proposed works. The A3 sheets highlight the habitats and identification of signs typical of the legally protected species that have potential to be present within the Scheme; precautionary methods of working and the procedures to be followed should they be recorded within the Scheme during the works.

Maps are provided in Appendix B that detail the locations of the crossings that have potential for each legally protected species to be present.

3 Rationale as to why a Precautionary Method Statement is considered appropriate

3.1 General licence/consent requirements

3.1.1 Designated site and HPIs

Sites of Special Scientific Interest (SSSI) are protected under the Wildlife and Countryside Act 1981 (as amended) and the Countryside and Rights of Way Act 2000 (in England and Wales). Local Wildlife Sites (LoWS) are designated by local authorities and hedgerows are protected under The Hedgerows Regulations (1997). Certain activities are prohibited on SSSI land without Natural England's consent. Permission from Natural England must be requested in writing if a listed activity is intended for the works. Proposals to carry out works within a LoWS or to remove a hedgerow must be discussed with the Local Planning Authority (LPA).

3.1.2 European Protected Species (EPS)

All species of bats found in the UK, great crested newts, hazel dormouse and European otters are EPS subject to the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012), Natural England's view is that: "If the consultant ecologist, on the basis of survey information and specialist knowledge of the species concerned, considers that on balance the proposed activity is reasonably unlikely to result in an offence under Regulation 41 or 45 then no licence is required". A range of factors are taken into consideration when assessing whether works can proceed in the absence of a licence including the nature of the proposals; the suitability of habitats within the Scheme to support protected species; evidence of such species; and proximity of existing known populations.

3.1.3 Nationally protected species

3.1.3.1 Badger

Badgers and their setts are protected under the Protection of Badgers Act 1992 (as amended) (see Appendix A). A licence may be required for any work within the vicinity of a sett that is likely to cause disturbance to badgers. Licences are not granted from December to June inclusive because cubs may be present within setts. When assessing the requirement for a licence in respect of development, Natural England states that badgers are relatively tolerant of moderate levels of noise and activity around their setts, and that a low or moderate level of apparent disturbing activity at or near to badger setts does not necessarily disturb the badgers occupying those setts.

3.1.3.2 Breeding birds

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended), with some species afforded greater protection under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). In addition to the protection from killing or taking that all birds receive, Schedule 1 birds and their young must not be disturbed at the nest. There are no licensing purposes that explicitly cover development activities affecting wild birds.

3.1.3.3 Common reptiles

There is no requirement for a licence where development works affect common species of reptiles. Instead, Natural England advise that where reptiles are present, they should be protected from any harm that might arise during the development works through appropriate mitigation.

3.1.3.4 Water vole

Water voles are protected under the Wildlife and Countryside Act 1981 (as amended). Licences can't be issued for the specific purpose of development or other construction activities which could have an impact on water voles.

When development work is proposed in or near an area which is either known to or likely to contain water voles, the developer will need to implement suitable mitigation to prevent impacts to water voles. The preferred mitigation option is to leave water voles in situ, with the development works adopting avoidance measures through redesign of the proposals.

Where impacts cannot be avoided, operations aimed at displacing water voles from a development site would need to be undertaken under a licence. In England, small scale (limited to continuous lengths of bank not exceeding 50 m) displacement of water voles can be carried out at certain times of the year (February to April) for the purposes of conservation under a Class Licence by a registered person. For larger scale displacements or displacements outside of this period, a site-specific conservation licence is required.

In the circumstances where it is considered that the best outcome for water voles is to capture and translocate to a different location, there may be genuine grounds for Natural England to issue a conservation licence for the purpose of translocating the water vole population to suitable alternative habitat.

3.1.3.5 White-clawed crayfish

White-clawed crayfish are protected under the Wildlife and Countryside Act 1981 (as amended). It is illegal to take or to sell white-clawed crayfish (Appendix A).

White-clawed crayfish is considered to be a species under major threat of global extinction and is referred to in various biodiversity related policies. Several organisations involved in works on rivers or other water bodies have general legal obligations to take the presence of white-clawed crayfish into account when issuing permissions to undertake works. There is no specific licence for development works. However, a licence is required to catch and relocate white-clawed crayfish to allow maintenance of waterbodies.

3.2 Rationale for this Precautionary Method Statement

3.2.1 Designated sites and HPIs

Impacts on designated sites are unlikely due to the localised, small scale nature of the works. Minimal habitat removal would be required for the creation of new routes. No potential loss of integrity to the SSSI/ LoWS is anticipated, no resurfacing of new access within the sites. Access to the SSSI/ LoWS would be unchanged and there are no implications for loss of habitat or disturbance.

Botanical surveys were carried out within Upper Colne Marshes SSSI at E57 to inform final alignment and avoid sensitive habitats. No new route is proposed within the designated site,

plans involve closing the private crossing and allowing private vehicles access to land via an existing public road, ramp and footpath.

Affected designated sites or HPIs at E30 and T05 that have not yet been assessed will require additional survey ahead of construction (Section 5). Detailed botanical surveys are required prior to any works to inform the final alignment (within the limits of the Order).

Hedgerow surveys were completed at crossings E02, E45 and E51/E52. None of the hedgerows were identified as 'important' under the "Hedgerows Regulations 1997". Routes will utilise existing gaps in hedgerows where possible and where removal is required, it will be minimal (1-2m) and is unlikely to have a significant impact on protected species that may use them.

It is proposed that work should proceed under the precautionary method detailed in Section 4.

3.2.2 Badger

Habitat loss would be small in the context of surrounding suitable habitats and no badger setts were identified within 30m of the proposed routes during the surveys. It is therefore considered reasonably unlikely that the works will result in wilful killing, injury or capture of badgers or intentional or reckless damage, destruction or obstruction of a sett. Similarly, it is considered reasonably unlikely that the works will result in deliberate disturbance to a badger whilst occupying a sett.

Therefore, on the basis of specialist knowledge and experience working with badgers, it is considered on balance that the works are reasonably unlikely to result in an offence under the Protection of Badgers Act 1992 and no licence is required.

However, to further ensure that such an offence is not committed, it is proposed that work should proceed under the precautionary method detailed in Section 4.

3.2.3 Breeding birds

Works carried out outside the typical core breeding bird season (1 September to 28 February 2018) are unlikely to cause an offence under the Wildlife and Countryside Act 1981 (as amended) with regards to any wild bird.

As the majority of the works are being undertaken during the core breeding bird season (considered to be 1st March to 31st August), it is proposed that work should proceed under the precautionary methods detailed in Section 4 to ensure that no offence is committed under the Wildlife and Countryside Act 1981 (as amended) with regards to any wild bird.

3.2.4 Great crested newt

In the absence of detailed survey information, a precautionary approach would be adopted whereby it is assumed that great crested newts may be present in the potential foraging and/or commuting habitats identified (Appendix B). The water bodies will not be directly affected by the works. However, foraging and/or commuting habitat within the site may be affected by the vegetation clearance. The works will result in small scale, localised ground disturbance which will take place over a short period of time.

The template for the Natural England Method Statement used for development licensing purposes (Natural England, 2015) includes a Rapid Risk Assessment, which provides an initial estimate of the potential risk of the proposed works resulting in an offence being a committed under the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012) and therefore

requiring mitigation and/ or a licence from Natural England. The calculation is based on the area of suitable habitat affected and the distance from breeding ponds. This calculator tool was applied to the proposed scope of works.

The result of the NE Rapid Risk Assessment is green: offence highly unlikely (see Appendix C).

Works are to 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.

Considering the habitats present within the footprint of the proposed works and in the wider area, and the small scale of the works it is considered reasonably unlikely that the works will result in deliberate capture, injury or killing of great crested newts.

Similarly, it is considered reasonably unlikely that the proposed works will result in deliberate disturbance to great crested newts in such a way as to be likely to impair their ability to survive, breed, reproduce, hibernate; or to affect significantly the local distribution or abundance of great crested newts.

Due to the limited potential for great crested newts to be using the habitats within the area of works it is considered reasonably unlikely that the proposed works will result in damage or destruction of their resting places.

As the works will not affect any ponds, they will not involve deliberate taking or destroying the eggs of great crested newts during the breeding season.

Therefore, on the basis of specialist knowledge and experience working with great crested newts, it is considered on balance that the proposed works is reasonably unlikely to result in an offence under the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012) and no protected species mitigation licence is required.

Similarly, it is considered reasonably unlikely that works will result in disturbing a great crested newt in its place of shelter or obstructing access to such a place and therefore the proposed works is reasonably unlikely to result in an offence under the Wildlife & Countryside Act 1981 (as amended).

However, to further ensure that such an offence is not committed, it is proposed that work should proceed under the precautionary method detailed below.

3.2.5 Hazel dormouse

Hedgerows to be crossed by the proposed route at E02 were reviewed to assess their connectivity to the surrounding network of hedgerows and areas of woodland, including ancient woodland, using OS mapping. The assessment considered the results of the initial ecological survey (identification of species rich / species poor hedgerows / hedgerow management). The results of the survey identified no significant areas of interconnected woodland linking to the hedgerows and woodland along the proposed new route at E02 and habitats are considered to by sub-optimal for dormouse.

To ensure that an offence is not committed during works at E02, it is proposed that work should proceed under the precautionary method detailed in Section 4.

An assessment of the suitability of habitats at E25, E28 and E29 is required to inform appropriate mitigation and licencing requirements. This survey will be required prior to construction (Section 5) and may identify the requirement for further surveys to inform licensing requirements. These additional licensed works (if required) are not covered by these

precautionary methods. Licences from Natural England can take six weeks (longer during busy periods or if the first submittal is not approved). The licence application needs to be informed by several months' worth of survey data (Section 5) and may have significant programming implications. The construction program needs to consider the seasonality of surveys and program them in accordingly to allow sufficient time for mitigation or licencing requirements, if necessary.

3.2.6 European otter

In the absence of detailed otter survey information, a precautionary approach has been adopted whereby it has been assumed that otters are present at crossings identified as having potential habitat for otter within the Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017). The majority of the proposed routes have no impacts anticipated to watercourses. Proposed routes that cross watercourses make use of existing crossings where possible. Where proposed routes require new crossings over a watercourse, the proposed works would have a low impact on this species if present. Any loss of foraging habitat will be temporary and the area very small in the context of the surrounding habitats.

No holts or potential resting places were identified within the ZoI during the surveys.

Considering the habitats present within the footprint of the proposed works and in the wider area and the localised scale and nature of the works, it is considered reasonably unlikely that the works will result in deliberate capture, injury or killing of otters.

Similarly, it is considered reasonably unlikely that the proposed works will result in deliberate disturbance to otters in such a way as to be likely to impair their ability to survive, breed, reproduce rear or nurture their young, or to affect significantly the local distribution or abundance of otters.

Due to the limited potential for otters within the ZoI of the crossings, it is considered reasonably unlikely that the proposed works will result in damage or destruction of otter resting places or otter breeding places.

Therefore, on the basis of specialist knowledge and experience working with otters, it is considered on balance that the proposed works are reasonably unlikely to result in an offence under Regulation 41 of the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012) and no protected species mitigation licence is required.

Similarly, it is considered reasonably unlikely that the proposed works will result in disturbing an otter in its place of shelter or obstructing access to such a place and therefore the works are reasonably unlikely to result in an offence under the Wildlife & Countryside Act 1981 (as amended).

However, to further ensure that such an offence is not committed, it is proposed that work should proceed under the precautionary method detailed in Section 4.

3.2.7 Common reptiles

In the absence of detailed survey information, a precautionary approach has been adopted whereby it has been assumed that common species of reptiles are present at crossings identified as having potential habitat for common reptiles within the Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017). The proposed works will not result in the long-term loss of large areas of this habitat or result in the permanent or temporary habitat fragmentation.

There are suitable habitats (grassland and scrub), suitable refuge and hibernation sites (for example log or stone piles, rabbit burrows and cable troughs) within the ZoI. There is a possibility that reptiles will therefore be encountered during the works. Any vegetation clearance should be undertaken during the active reptile season (March to October) and at sufficiently high temperatures (ie above 10°C). If vegetation clearance is carried out during the reptile hibernation season, should hibernating reptiles be recorded, they will be left undisturbed and their place of shelter returned to its original condition. Only where this is not possible shall the reptiles be removed with minimal handling and placed in a suitable, safe habitat to enable continued hibernation/ torpor. The works are therefore likely to result in small scale disturbance to reptiles during the hibernation period; this level of disturbance is not considered to be significant.

On the basis of specialist knowledge and experience working with common lizards, slow worms, grass snakes and adders, it is considered that the proposed works are reasonably unlikely to result in an offence under the Wildlife and Countryside Act 1981 (as amended) and translocation of reptiles from the Site is not considered necessary.

However, to further ensure that such an offence is not committed, it is proposed that work should proceed under the precautionary method detailed in Section 4.

3.2.8 Water vole

In the absence of detailed survey information, a precautionary approach has been adopted whereby it has been assumed that water voles are present within the site. The majority of the proposed routes have no impacts anticipated to watercourses. Proposed routes that cross watercourses, make use of existing crossing where possible. Where proposed routes require new crossings over a watercourse, the proposed works would have a low impact on this species if present. Any loss of foraging habitat will be temporary and the area very small in the context of the surrounding habitats.

Any affected watercourses that have not yet been assessed for water vole potential will require additional survey ahead of construction (Section 5). Further survey work may identify the requirement for a water vole licence to be obtained. These additional licensed works (if required) are not covered by these precautionary methods. Licences from Natural England can take six weeks (longer during busy periods or if the first submittal is not approved). The construction program needs to consider the seasonality of surveys and program them in accordingly to allow sufficient time for mitigation or licencing requirements, if necessary. Attention has been paid to the presence of water voles and, as far as is reasonable, appropriate action should be taken to safeguard the animals and their places they use for shelter and protection (see Section 4). On the basis of specialist knowledge and experience working with water voles, it is considered on balance that displacement of water voles under licence may be required following the additional surveys.

3.2.9 White-clawed crayfish

In the absence of detailed survey information, a precautionary approach has been adopted whereby it has been assumed that white-clawed crayfish are present along the proposed route for crossings E17 and E18. Consultation is ongoing regarding the location of the culvert for the route and further surveys may be advised by the ecologist. These additional licenced works (if required) are not covered by these precautionary methods.

The majority of the proposed routes will have no impacts anticipated to watercourses. Proposed routes that cross watercourses, make use of existing crossing where possible. Where proposed

routes require new crossings over a watercourse, the proposed works would have a low impact on this species if present.

Therefore, on the basis of specialist knowledge and experience working with white-clawed crayfish, it is considered on balance that translocation of white-clawed crayfish is not required and an offence under the Wildlife and Countryside Act 1981 (as amended) is reasonably unlikely to occur. However, to further ensure that such an offence is not committed, it is proposed that work should proceed under the precautionary method detailed in Section 4.

4 Precautionary Method Statement

4.1 General measures

The details of the precautionary methods will form the basis for a site briefing with the Contractor. A Mott MacDonald Ecologist will be present prior to the commencement of the site works to undertake a brief Tool Box Talk (TBT). The TBT will outline the known and potential ecological constraints within the footprint of the Scheme and sets out the methods of working that need to be employed by Network Rail for minimising impacts to protected species during the proposed works. A record of attendance to be completed as part of the TBT is provided in Appendix E.

It will be the responsibility of the Network Rail to ensure the measures detailed in these precautionary methods are undertaken. A member of staff that will be present on the Scheme for the full duration of the works will be appointed by Network Rail as the Scheme's Ecological Representative. The role of the Ecological Representative is to ensure that in the absence of an ecologist, works continue to comply with the precautionary methods. They will be fully briefed by an ecologist as to how to identify protected species, and what to do if these species are found.

Where necessary, the Ecologist will remain on the Scheme to ensure the measures set out are undertaken in accordance with the Precautionary Methods. Certain tasks identified within this report can only be undertaken by an ecologist and these are specified within Section 4.2. . The Ecological Representative will ensure that a copy of the Precautionary Method Statement is available during the works.

A list of telephone numbers of Ecologists and Ecological Representative (to be added once known) is included in Appendix D in case a protected species is found and further advice is required.

4.2 Species specific measures

Species specific precautionary methods are presented in this section. Each A3 sheet highlights the habitats and identification of signs typical of the legally protected species that have potential to be present within the Scheme; precautionary methods of working and the procedures to be followed should they be recorded within the Scheme during the works. Maps are provided in Appendix B for each legally protected species and to show the crossings where these species may be present.

4.2.1 Designated sites and HPIs

Where any proposed route alignment crosses through a statutory designated site/ non-statutory designated site or protected hedgerow, detailed botanical surveys are required prior to any works to inform the final alignment (within the limits of the Order). Further surveys are recommended in Section 5.

4.2.1.1 Sites of Special Scientific Interest (SSSI)

Natural England can designate land as an SSSI which are protected by law to conserve their wildlife or geology. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981 (as amended). Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales).

There are certain activities (dependent on the designated site) that require consent from Natural England to carry out on SSSI land as they may damage the features of interest. It is usually possible to carry out some of the activities in certain ways, or at specific times of year, or on certain parts of the SSSI, without damaging the features of interest. Consultation with Natural England is required as the activities may require consent.

Consultation with Natural England is ongoing to inform proposals at E02, E30, H05, H06 and H09. The proposed routes associated with these crossings either cross through or adjacent to Statutory Designated Sites (SSSI).

4.2.1.2 Local Wildlife Sites (LoWS)

Local authorities may designate certain areas as being of local conservation interest. The criteria for inclusion, and the level of protection provided, may vary between areas. LoWS are areas of land with significant conservation importance. In Essex and Others, they are typically an area of ancient woodland, a flower-rich hay meadow or a village pond. These sites, which may be given various titles such as 'Listed Wildlife Sites' (LWS), 'Local Nature Conservation Sites' (LNCS), 'Sites of Importance for Nature Conservation' (SINCs), or Sites of Nature Conservation Importance' (SNCIs), together with statutory designations, are defined in local and structure plans under the Town and Country Planning system and are a material consideration when planning applications are being determined.

The proposed route of new sections of footpath will cross through non-statutory designated sites LoWS at E33, E42, E57, T05, HA4, H05, H06 and H09. LoWS or SINCS also lie immediately adjacent to E02, E04, E09, E19 and H04.

NVC surveys carried out at E57 did not identified any HPIs under the footprint of the proposed route. However, reedbed was identified within the wider area of the proposed works. Contractors are to be made aware of the sensitivity of surrounding habitats associated with the LoWSs and works are to follow these Precautionary Methods to minimise impacts. Contractors should restrict movements to the alignment only and have any welfare units outside the boundary of the LoWS and where possible, on hard standing.

Access to each LoWS or SINC 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 LoWS or SINCs. However, consultation with the relevant county ecologists/ Wildlife Trusts is ongoing.

Contractors are to be made aware of the sensitivity of surrounding habitats associated with the designated sites. Contractors should restrict movements to the alignment only and locate any welfare units/site vehicles, if required, outside the boundary of the CWSs and where possible, on hard standing to minimise impacts.

4.2.1.3 Protected hedgerows

The Hedgerows Regulations (1997) protect countryside hedgerows. A countryside hedgerow is protected if it meets certain criteria for length, location and ‘‘importance’. A hedgerow is important (and is protected) if it is at least 30 years old and meets at least one other criteria set out under Hedgerows Regulations (1997). The regulations allow the Planning Authority to protect 'important' countryside hedgerows by controlling their removal through a system of notification.

Hedgerow surveys were completed at crossings E02, E45 and E51/E52 to determine whether the hedgerow met the criteria to qualify as 'important' under the Hedgerow Regulations 1997. None of the hedgerows were identified as ‘important’ under the “Hedgerows Regulations 1997”.

Hedgerow surveys are required at E04, E13, E25, E28, E29, , E51, T01, T04, T05 (Section 5).

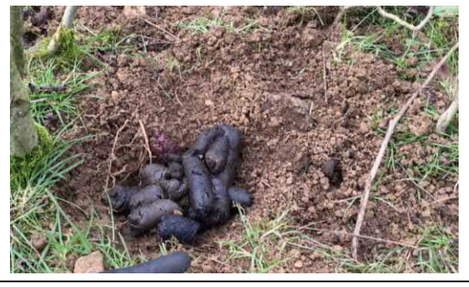
4.2.2 Badger

Habitats and identification on site

Badger sett openings are D-shaped, typically situated on sloping ground in or near woodland clearings or at the base of hedgerows. Typically, a spoil heap will be piled up outside the sett entrance and old bedding may also be present. The sett can be a single entrance, or many entrances with obvious pathways between them.

Badger prints have five toes, a wide palm and five long claws.

Badgers dig latrines to contain their dung, which is distinguishable from dog or fox dung as it is often soft with an earthy smell.



4.2.2.1 Crossings where badgers may be present

During the field surveys, one active badger sett was identified within 100m from the proposed route at E25. No other badger setts were identified during the field surveys undertaken between March 2016 and September 2017 (See Anglia Level Crossing Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017) and Map in Appendix B). Dense scrub and woodland at proposed routes for crossings E04, E06, E25, E28, E29, E37, E38, T01, T04 and T05 acted as a constraint to the surveys and further surveyed are required (Section 5).

4.2.2.2 Precautionary Method

All routes should have a walkover ahead of works to identify potential badger setts. A preconstruction check for badgers to be carried out by an ecologist within section of proposed route in woodland at E25.

Vegetation clearance should be undertaken in the presence of an ecologist using hand tools only in areas of dense scrub. 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.

Any excavations should be filled or covered overnight. If this is not possible, one side of the excavation should be graded so that it provides an escape ramp to prevent any animals becoming entrapped.

Works will be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity

4.2.2.3 What to do

Badgers are active throughout the year and can excavate new setts at any time. A walkover survey will be undertaken prior to the start of works. The works are of short duration therefore, in the unlikely event that a new badger sett is found within 30m of proposed works, advice should be sought from an ecologist prior to the start of works (Appendix D).

4.2.3 Bats

Habitats and identification on site

There are 18 species of bats resident in the UK. They vary in size and appearance, but the smallest and most commonly encountered is the common pipistrelle *Pipistrellus pipistrellus.* These are approximately 2.3–3.6cm in length and can crawl into cracks and crevices in buildings and trees.

Identification of bat droppings

Bat droppings look very similar to rodent droppings but are dry and will crumble to dust under very little pressure. Bat droppings vary in size according to species. The most likely place to record bat droppings is within cracks and holes within mature trees (see photo above). There may also be some staining where the bats may be entering a space.

Moth wings may be interspersed amongst the droppings.

4.2.3.1 Crossings where bats may be present

Mature trees and buildings/structures with potential for bats that lie adjacent or along to proposed routes are presented in Appendix B. There is a confirmed common pipistrelle roost (non-breeding) within a building west of the proposed route at E04 (See Anglia Level Crossing Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017) and Map in Appendix B).

4.2.3.2 Precautionary Method

Any affected trees that have not yet been assessed for bat potential will require additional survey ahead of construction. Further survey work may identify the requirement for a bat licence to be obtained. Additional licenced work (if required) is not covered by these precautionary methods.

Further surveys: Detailed Ground level tree assessments are required of trees along proposed routes at E06, E11, E25, E28, E41, T04, T05 to inform further survey and mitigation requirements in relation to bats prior to removal/ trimming. Surveys at E41 are to be completed by Network Rail as they are lineside (See Section 5).

Works (general): Night time works taking place in the vicinity of the trees should have artificial lighting directed away from the trees to avoid potential disturbance to roosting bats. In accordance with Bat Conservation Trust (BCT) Interim Guidance (BCT, 2014) lighting associated with the works should be the minimum required for the task.

Works (tree felling): Tree removal will be kept to a minimum for the Scheme. Prior to vegetation clearance a suitably experienced ecologist will inspect trees for features suitable for roosting bats. All trees within the ZoI which have been assessed as having bat roost potential and which require felling will then be subject to detailed external and internal inspections of all ecological features of importance to roosting bats in order to establish the presence of, or evidence of, bats immediately prior to the trees being felled. The felling of the tree will only be permitted if it can be demonstrated that there will be no subsequent disturbance or damage/destruction of other trees confirmed as supporting bats.

Where it is not possible for any reason, to inspect a tree (holes/hollows/cavities) in situ, that is considered to have bat potential, the section of tree containing the hole/hollow/cavity will be cut and carefully lowered to the ground using soft-fell techniques (i.e. lowering the section of tree carefully to the ground using ropes).

If bats (alive or dead) or evidence of the presence of bats is found removal of the tree(s) will need to be undertaken under a mitigation licence. If bats are considered to be absent, it is recommended to fell the tree(s) in sections to maintain the integrity of any Potential Roost Feature (PRFs) present. Each section with a PRF should be lowered to the ground and subjected to a final check using an endoscope prior to its disposal. If bats are found during this final check, the tree section should be moved out of the works footprint with the cavity unobstructed to allow the bats to leave at dusk.

4.2.3.3 What to do

If a bat (dead or alive) or evidence of bat presence (such as droppings or feeding remains) is found on Site, all works must cease in that area and advice should be sought from an ecologist (Appendix D).

4.2.4 Breeding birds

Habitats and identification on site

Birds can nest in trees, scrub and dense ground vegetation as well as buildings and infrastructure. A nest often creates an anomaly with its surroundings in terms of shape, colour or structure.

During breeding, birds may fly up from the ground when disturbed. They can be observed carrying nest material or food. They can be on sentry duty or repeatedly singing from a prominent place, one of these is usually close to the nest. Birds show agitated behaviour, feigning injury and/or repeated calling when the nest is disturbed.

1. Song thrush *Turdus philomelos* nest

2. Skylark *Alauda arvensis* nest

4.2.4.1 Crossings where breeding birds may be present

The full extent of the proposed works will be covered by the precautionary methods with respect to common breeding birds. The reedbed and scrub adjacent to the proposed route at E33 provide suitable habitat for Cetti's warbler, a Schedule 1 bird (See Anglia Level Crossing Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017) and Map in Appendix B).

4.2.4.2 Precautionary Method

Schedule 1 birds

Further surveys: A breeding bird survey is required at E33 where habitats with potential to support Cetti's warbler require removal during breeding bird season (considered to be 1st March – 31st August) (Section 5).

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 during proposed works. 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).

All breeding birds

Vegetation clearance should be undertaken outside the breeding season (1st September to 28th/29th 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. Nests with large chicks should not be approached as it may cause chicks to fledge prematurely.

Works would also be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.

4.2.4.3 What to do

If a bird's nest is found on site and you are unsure of what to do, seek advice from an ecologist (Appendix D).

4.2.5 Great crested newt

Habitats and identification on site

Great crested newts will utilise ponds and static watercourses to breed during spring and early summer. Adult newts generally leave the breeding ponds from late May onwards and return between February and March. Juveniles will emerge from the breeding ponds from August and will usually remain on land for two to four years until they reach sexual maturity.

Suitable habitats whilst on land include rough (tussocky) grassland, scrub and woodland. Log piles, rock piles underground crevices, tree and hedge roots, mammal burrows, and brash are particularly important habitats for great crested newts during hibernation in the winter. Hibernation usually takes place between October to February depending on seasonal variation.

If suitable terrestrial habitat is present great crested newts are likely to stay within 250 m of their breeding pond (Cresswell & Whitworth, 2004)

Great crested newts are the largest species in the UK and can measure between 14 and 16 cm. They have dark grey-brown backs and flanks, and are covered with darker-coloured spots. Their undersides are yellow/ orange-coloured and are covered in large, black blotches.

1. Male great crested newt (right) and smooth newt (left)

2. Great crested newt showing orange colour and large, black blotches

4.2.5.1 Crossings where great crested newts may be present

Waterbodies with potential to support breeding populations of great crested newts were identified within 250 m from aerial imagery and OS maps. No Habitat Suitability Index (HSI's) have been undertaken of these water bodies. An HSI is a numerical index (between 0 and 1) which was developed as a means of evaluating quality and quantity of habitat for great crested newts. All sections of the scheme that take place in terrestrial habitat that is considered to have some potential to support great crested newts are show in a map in Appendix B and Anglia Level Crossing Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017).

4.2.5.2 Precautionary Method

Any vegetation clearance should be undertaken during the active great crested newt season (March to October). A TBT would be given to all contractors working within the area, prior to the start of works, 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 for the presence of great crested newt, prior to works.

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.

A further vegetation cut would be carried out in the presence of an ecologist 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.

Works will be carried out in accordance with Network Rails CR-E whereby the contractor shall protect and enhance the existing biodiversity.

4.2.5.3 What to do

If at any time during the works a great crested newt is seen, all works should halt (when safe to do so) and the Ecologist must be contacted immediately. The Ecologist will then be able to advise on an appropriate course of action. At no time should you attempt to handle a great crested newt as incorrect handling can cause injury/death.

4.2.6 Hazel dormouse

Habitats and identification on site

The dormouse has gingery-brown fur, large black eyes and a fluffy tail. They live in in deciduous woodland, hedgerows and dense scrub.

In winter (October to April/May), the hazel dormouse will hibernate in nests on the ground in the base of old coppiced trees or hazel stools, under piles of leaves or under log piles.

Examination of hazelnuts may show a neat, round hole in the shell. The cut surface of the hole has toothmarks which follow the direction of the shell.

4.2.6.1 Crossing where hazel dormouse may be present

There is potential habitat for hazel dormouse within woodland and hedgerows along the proposed routes at some of the crossings (See Anglia Level Crossing Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017) and Map in Appendix B).

4.2.6.2 Precautionary Method

Any affected woodland/ hedgerows that have not yet been assessed for dormouse potential will require additional survey ahead of construction (Section 5). Further survey work may identify the requirement for a dormouse licence to be obtained. Additional licenced work (if required) is not covered by these precautionary methods.

Further assessment of habitat suitability (optimal vs sub-optimal) were completed at E02. No significant areas of interconnected woodland linking to the hedgerows and woodland along the proposed new route were identified. Habitats are therefore considered to be sub-optimal for dormouse.

Additional habitat suitability surveys for this species are required at crossings E25, E28, and E29. This assessment would be based on habitat connectivity, vegetation density and height and abundance of fruiting shrubs.

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 et al, 2006).

In sub-optimal habitats, a precautionary approach would be adopted for vegetation clearance. In the unlikely event that a dormouse is present, this will to minimise the likelihood of injury/ death. Works would require small-scale and localised ground disturbance.

Vegetation clearance would only occur following hand searches by a licensed ecologist. Once the area has been checked and dormice are confirmed absent from the area, vegetation clearance should be undertaken by hand, in a slow and directional manner in the presence of the ecologist. The timing of vegetation clearance should avoid sensitive periods such as hibernation (October/ November to April/ May) and when female dormice are likely to have young in their nests (between early June and late September), to minimise risks of harm or injury in the unlikely event that dormouse are present.

4.2.6.3 What to do

If at any time during the works a dormouse or dormouse nest is seen, all works should halt (when safe to do so) and Ecologist must be contacted immediately (Appendix D).

4.2.7 European otter

Habitats and identification on site

Otters occur in both rural and urban areas, including major cities. They will use any size watercourse. Places where they are found include rivers, canals, lochs and reservoirs, estuaries, coasts, streams, ponds, bogs, marshes and woodland. Otters may use a variety of places as 'holts' or sheltering places, for instance within well covered vegetation or in-between boulders/ rocks.

They are chocolate brown in colour with flattened heads, webbed feet and thick tapering tails.

Other ways to identify the presence of otter are from field signs, including prints (as shown above), spraints (faeces) and feeding remains.

4.2.7.1 Crossings where otters may be present

Rivers, streams and woodland with potential for otters that lie adjacent or along to proposed routes are presented in Anglia Level Crossing Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017) and Map in Appendix B.

4.2.7.2 Precautionary Method

Further surveys: Assessment of suitability of ditches to support otters is required at E06, E25 (Section 5). These are to be undertaken preconstruction to inform appropriate mitigation during construction where relevant. Surveys to follow best practice (Natural England, 2014).

Works should be carried out ensuring there is no obstruction of watercourses during works to allow otters to continue commuting along the watercourse throughout the duration of the works.

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. Where night works are required adjacent to habitat considered suitable for otter, directional lighting would be used to reduce light spill. It is recommended that all works near water are undertaken with regard the Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites. Works will be carried out in accordance with Network Rail's CR E whereby the contractor shall protect and enhance the existing biodiversity.

4.2.7.3 What to do

If at any time during the works an otter or possible otter holt is seen, all works likely to cause damage or destruction to a holt (vegetation clearance, excavation, movement of machinery etc) should halt (when safe to do so) and the Ecologist must be contacted immediately (Appendix D).

4.2.8 Common reptiles

Habitats and identification on site

Britain supports four species of common reptile which are found throughout a number of habitat types and can be found in large numbers within grassland, scrub and near wet areas such as ponds.

1. Common lizard *Zootoca vivipara*

ID: The common or viviparous lizard is widespread. It is a small, very quick brown lizard. Typical adult size is approx. 15cm (including its tail) and coloration is commonly some shade of brown with patterns of spots or stripes. Unusual colour variations are common, everything from yellow through various shades of green to jet black are encountered.
Habitat: Most frequently seen on commons, heaths, dry stone walls, and embankments around the British Isles

2. Slow worm *Anguis fragilis*

ID: The slow worm is a lizard which has evolved into a legless form with the development of a burrowing habit. Appearance is always shiny; the males are grey, and the females brown with dark sides and a thin line down the back.
Habitat: The slow-worm can be found in almost any open or semi-open habitat. It likes warmth but instead of basking in the open sun it prefers to hide under a stone, log or piece of discarded rubbish such as a sheet of corrugated iron or plank of wood exposed to the sun.

3. Grass snake *Natrix natrix*

ID: The grass snake is the largest UK snake. Grass snakes are typically grey-green in colour, often with black spots and a yellow/cream/orange collar. Black lines run down from their large golden eyes to their top lips. Their underside is usually white or pale yellow with a checkering of blue-black and white markings. Their forked tongues are blue-black.
Habitat: Preferred habitats tend to be associated with water e.g. ponds, lakes, reservoirs, marshes, river valleys but, also requires a range of terrestrial habitats, including grassland, scrub and woodland

4. Adder *Vipera berus* (Female)

5. Adder (Male)

ID: Adders have a venomous bite, but this is rarely fatal to humans. A full-grown adult adder can be up to 65 cm long. Adders have a dark zig-zag running along the back and a dark V on the back of the head. As with all reptiles, colouration varies and becomes duller as sloughing (skin shedding) approaches. If a black snake is encountered (melanistic) it is best practice to treat this as an adder.
Habitat: Adders are usually associated with open heathland in the southern regions, although they also often occur in dense woodland and in particular open, sunny areas within woodland.

4.2.8.1 Crossings where common reptiles may be present

The full extent of the proposed works will be covered by the precautionary methods with respect to common reptiles (See Anglia Level Crossing Ecology Constraints Report: Essex and Others and Map in Appendix B).

4.2.8.2 Precautionary Method

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 ecological 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 outside the working area. Where it is not essential to remove potential refuges 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.

4.2.8.3 What to do

Any reptile found during the site work should be left to move away of its own accord. If a common lizard, slow worm or grass snake does not move away from the footprint of the works, they can be carefully moved by hand, taking care to any avoid injury and relocated in a suitable area (i.e. dense vegetation) within the immediate surrounds. Adders should not be handled as their bite is venomous and could cause serious injury. If a large number of reptiles are observed (i.e. more than five), work should stop and an ecologist should be contacted for advice regarding how to proceed.

4.2.9 Water vole

Habitats and identification on site

European water voles are a uniform dark brown colour, with slightly paler coloration on the underside. Their pelage is quite thick and they are furred over their entire body, including their tail. They are found in slow moving rivers streams ditches and around lakes, reed-beds marshes and ponds.

Water voles will establish burrows several meters from a water course. Water vole burrow entrances are typically wider than high with a diameter of 4-8cm, located at the water's edge, on banks or at the top of banks, occurring within vegetation up to 5m from the water.

Latrines and feeding remains of large grasses and rushes are known to be good survey indicators of this species.

4.2.9.1 Crossing where water voles may be present

Streams and ditches with potential for water voles that lie adjacent or along to proposed routes are presented in Anglia Level Crossing Ecology Constraints Report: Essex and Others and Map in Appendix B.

4.2.9.1 Precautionary Method

Where potential impacts to water vole are considered possible (E06, E17/E18, E33, H04, H05, H06, H09, T04), preconstruction water vole presence/absence surveys will be undertaken to inform detailed mitigation and licensing requirements. Surveys to follow best practice (Dean et al, 2016). Water vole burrows will be accurately mapped during surveys and no works will be carried out within 10m of a burrow.

It is recommended that all works near water are undertaken with regard the Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites.

Works would be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.

4.2.9.2 What to do

A preconstruction survey will be undertaken prior to the start of works. However, in unlikely event that a potential burrow is discovered during works (in the absence of an ecologist), all works likely to cause damage or destruction to a burrow (vegetation clearance, excavation, movement of machinery etc) should halt (when safe to do so) and the Ecologist must be contacted immediately (Appendix D).

4.2.10 White-clawed crayfish

Habitats and identification on site

White-clawed crayfish are approximately 10 to 12cm in length and typically live in rivers, streams and lakes about 1m deep, where they hide among rocks, tree roots, submerged logs and emerge to forage for food.

The body of the White-clawed is relatively smooth apart from areas shown with spines. Its claws are smaller relative to body size & are rough on the top. Undersides of claws are lighter than the top (hence white clawed).

4.2.10.1 Crossing where white-clawed crayfish may be present

Rivers, streams and ditches with potential for white-clawed crayfish that lie adjacent or along proposed routes at E17 and E18, presented in Anglia Level Crossing Ecology Constraints Report: Essex and Others and Map in Appendix B. Consultation is ongoing regarding the location of the culvert and further surveys may be advised by the ecologist.

4.2.10.2 Precautionary Method

Any works to the banks (particularly excavation, removal of stones, overhanging vegetation or rubbish removal should be supervised by the ecologist. The ecologist should check potential crayfish hiding places such as overhanging vegetation, crevices and holes in the bankside and under rocks or stones within and adjacent to the works area.

Minimise the amount of disturbance to river banks and where feasible, do works on the bank in short sections in succession, rather than all at once. Avoid wandering out of the works area by clearly defining the site limits.

Provide replacement habitat for crayfish via the installation of natural or artificial refuges. For example: holes through into the bank; facing with un-mortared stones, engineering brick or breeze blocks; incorporating short lengths of pipe into or through the structure in a range of sizes, (e.g.15mm to 150mm). Any materials required to create crayfish habitat should be clean and ready before work starts.

Avoid works within the water course or immediate bankside in late May or June, when crayfish are releasing their young.

Construction Hygiene as illustrated below should be employed:

1. Arrive at the site with clean footwear PPE and machinery and vehicles, particularly if they have come from use on other water sites where crayfish are likely to be present and ensure footwear is clean (visually from soil and debris) before leaving the site.
2. Keep access to a minimum keep to established tracks and park vehicles on hard standing. Ensure vehicle and machinery is kept clean - in particular remove any accumulated mud before leaving the site.
3. Any PPE, vehicles or equipment that has been in the water course or on its immediate banks should be disinfected with hypochlorite bleach or an iodophor (at least 100ppm available iodine) such as Virkon. If this cannot be done, ensure all machinery and other equipment is thoroughly cleaned and allowed to dry completely before leaving the site. Wash containing the disinfectant should not be allowed to enter the water course.
4. If any alien crayfish are found (Section 4.2.10.3), advise the Environment Agency immediately.

It is recommended that all works near water are undertaken with regard the Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites.

Works would be carried out in accordance with Network Rail's CR-E whereby the contractor shall protect and enhance the existing biodiversity.

4.2.10.3 Non-native invasive crayfish species

Signal crayfish - An American non-native invasive species. Its body is smooth. The claws are large relative to body size, smooth on the top and the undersides are red. There is a prominent white or bluish patch on each claw at the top of the finger joint.

Turkish crayfish – A Turkish non-native invasive species. Its body is rough at the front, behind the head. The claws are long and slender relative to body size and have a rough surface.

4.2.10.4 What to do

If a white clawed crayfish or suspected crayfish are identified during the course of the works then the works should cease (when safe to do so) and the Ecologist must be contacted immediately (Appendix D). A crayfish catch box should be kept onsite to hold any suspected "alien" crayfish for removal by the ecologist.

4.2.11 Non-native invasive plant species

(Indian balsam, Japanese knotweed and floating pennywort)

Habitats and Identification on site

1. Indian balsam

Indian Balsam is a non-native and invasive plant species in the UK, and occurs in a variety of disturbed habitats, especially on riverbanks, waste ground and open woodland. Indian Balsam plants can grow up to 2.5-3m tall and reproduce through seeds only.

2. Japanese knotweed

Japanese Knotweed is a non-native and invasive plant species in the UK, and occurs in a variety of disturbed habitats, especially on riverbanks, roadsides, waste ground and railway embankments. Japanese Knotweed plants have vigorous rhizomes (underground stems) which may extend laterally to 7m and 3m deep from the parent plant. Seeds are produced but they are not viable – the plant only reproduces through the underground rhizomes

3. Floating pennywort

Floating pennywort is a non-native and invasive aquatic plant species in the UK, and occurs in lakes, ponds and other water-based habitats. Small fragments are able to root, thus aiding establishment and often changing the availability of oxygen in the water, threatening fish and invertebrates, choking drainage systems and crowding native water plants.

4.2.11.1 Crossings where non-native invasive species may be present

There are biological records of non-native invasive plant species within 500m of a number of crossings (See Anglia Level Crossing Ecology Constraints Report: Essex and Others and Map in Appendix B).

4.2.11.2 Precautionary Method

It is an offence to plant or otherwise cause non-native invasive plant species (Indian balsam, Japanese knotweed and floating pennywort) to grow (spread) in the wild.

No non-native invasive plant species were recorded in the ZoI of any of the crossings during the filed surveys. Considering the localised scale and nature of the works, it is considered reasonably unlikely that the works will result in an offence.

4.2.11.3 What to do

If a previously unrecorded non-native invasive plant species (such as Indian balsam, Japanese knotweed or floating pennywort) is suspected on Site, an ecologist should be contacted (Appendix D). If it is confirmed to be a non-native invasive plant species, advice should be sought from gov.uk.

5 Additional Survey Requirements

The table below provides a summary of additional survey requirements for the scheme following the Anglia Level Crossing Ecology Constraints Report: Essex and Others (Mott MacDonald, 2017) (excluding those completed between July and September 2017). The additional surveys will be undertaken at an appropriate time of year for the species of concern and sufficient time will be incorporated into the program if a protected species licence is required. The detailed programme of works is unknown at this stage and will be finalised post-consent. However, the ecological assessment will be updated where changes occur.

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

Table 1: Further Survey Requirements: Essex and Others

Ecological Feature	Survey Requirements	Timings
HPIs in Statutory Designated Sites	E30 - Further botanical survey required to inform detail design and avoid impacts to sensitive habitats. Requirements for survey informed by consultation with Natural England and relevant County Ecologist/Wildlife Trust (consultation ongoing)	Preconstruction: at appropriate survey time (June-August) One survey to be conducted during the optimal period and at least 8 weeks prior to the start of work to allow sufficient time for mitigation.
HPIs in Non-statutory Designated Sites	T05 - Further botanical survey required to inform detail design and avoid impacts to sensitive habitats.	Preconstruction: at appropriate survey time (June-August) One survey to be conducted during the optimal period and at least 8 weeks prior to the start of work to allow sufficient time for mitigation.
HPIs: Hedgerow	E04, E13, E25, E28, E29, T01, T04, T05 Hedgerow survey required to determine species richness. Where appropriate the hedgerow will be considered against the Hedgerow Regulations 1997 to identify any hedgerows which would be classified as 'important'	Preconstruction: April to October (June-July optimal) One survey to be conducted during the optimal period and at least 8 weeks prior to the start of work to allow sufficient time for mitigation
Bats	E06, E11, E41, E25, E28, T04, T05 – Detailed inspection of trees which will be directly affected by works. Ground level tree assessments required of trees along proposed route to inform further survey and mitigation requirements. Trees with low bat roost potential should be surveyed using an endoscope to check for evidence of the presence of roosting bats in PRFs. Trees with moderate to high bat roost potential should be subject to a climb-and-inspect survey of PRFs using an endoscope to rule out the presence of roosting bats.	Preconstruction: Any time of year, though winter is optimal when obscuring vegetation is no longer present on trees. Where access refused, further survey to be undertaken preconstruction. These surveys may identify the requirement for multiple emergence/re-entry surveys between May and September (with at least two surveys between May and August for high roost suitability). Licences from Natural England can take six weeks (longer during busy periods or if the first submittal is not approved).

Ecological Feature	Survey Requirements	Timings
Badger	E04, E06, E25, E28, E29, E37, E38, T01, T04, T05 – further survey required of inaccessible areas	Preconstruction: optimal time spring/autumn One survey to be conducted during the optimal period. The construction program needs to consider the seasonality of surveys and program them in accordingly to allow sufficient time for mitigation or licencing requirements, if necessary. Licences from Natural England can take six weeks (longer during busy periods or if the first submittal is not approved). Licences to exclude badgers and to close down or destroy a sett are only issued between 1 July and 30 November.
Breeding Birds	E33 - Breeding bird survey required where habitats with potential to support Cetti's warbler require removal during nesting bird season	Preconstruction: Minimum three visits (end March – June) undertaken at one monthly intervals The construction program needs to consider the seasonality of surveys and program them in accordingly to allow sufficient time for mitigation or licencing requirements, if necessary. Preconstruction: any time of year
Hazel Dormouse	E25, E28, E29, - 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. Further survey work may identify the requirement for nest tube surveys. Nest tubes are set out in April/ May. Each tube should be checked regularly, at least once every 2 months until November. A scoring system is used whereby the score needs to be over 20 to judge presence or likely absence. An index table of values for all the months during which tubes are in place is used to calculate the score. Nest boxes can also be used alongside a nest tube survey to increase the probability of finding dormice. They would also be useful for post development monitoring. If required, a European Protected Species (EPS) mitigation licence from Natural England can take six weeks (longer during busy periods or if the first submittal is not approved). The construction program needs to consider the seasonality of surveys and program them in accordingly to allow sufficient time for mitigation or licencing requirements, if necessary.
Otter	E06: Assessment of suitability of ditch to support otters required to inform further survey and mitigation requirements	Preconstruction: Any time of year, though winter is optimal when obscuring vegetation is no longer present One survey to be conducted during the optimal period and at least 8 weeks prior to the start of work to allow sufficient time to apply for an EPS mitigation licence from Natural England licence, if required. Licences from Natural England can take six weeks (longer during busy periods or if the first submittal is not approved).

Ecological Feature	Survey Requirements	Timings
Water vole	E06, E17/E18, E25, E33, H04, H05/ H06/ H09, T04: Assessment of suitability of ditch to support water voles required to inform further survey and mitigation requirements	Preconstruction: Survey period mid-April to late September Preconstruction: Surveys are required to inform mitigation and licencing requirements (mid-April to late September). If required, a class licence from Natural England for displacement of water voles can take six weeks (longer during busy periods or if the first submittal is not approved). Displacement of water voles can only be carried out at certain times of the year (February to April) for the purposes of conservation under the Class Licence.
Invasive Species	Preconstruction check	Preconstruction walkover
Other notable species	Preconstruction check	Preconstruction walkover
Inaccessible areas	E06, E37, HA04, T04, T05: Further surveys required where no access permitted.	Preconstruction: Any time of year One survey to be conducted during the optimal period and at least 8 weeks prior to the start of work to allow sufficient time for mitigation.
New routes/propose d works	E04, T01: Full walkover survey required following design change	Preconstruction: Any time of year One survey to be conducted during the optimal period and at least 8 weeks prior to the start of work to allow sufficient time for mitigation.
All	Due to the mobility of animals and the potential for colonisation of new 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. A preconstruction walkover survey would be undertaken of each proposed route option to confirm baseline conditions and refine requirements for mitigation during works.	Preconstruction walkover The construction program needs to consider the seasonality of surveys and program them in accordingly to allow sufficient time for mitigation or licencing requirements, if necessary.

Source: Mott MacDonald

6 References

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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 06 October 2017].

Appendices

A. Summary of legislation

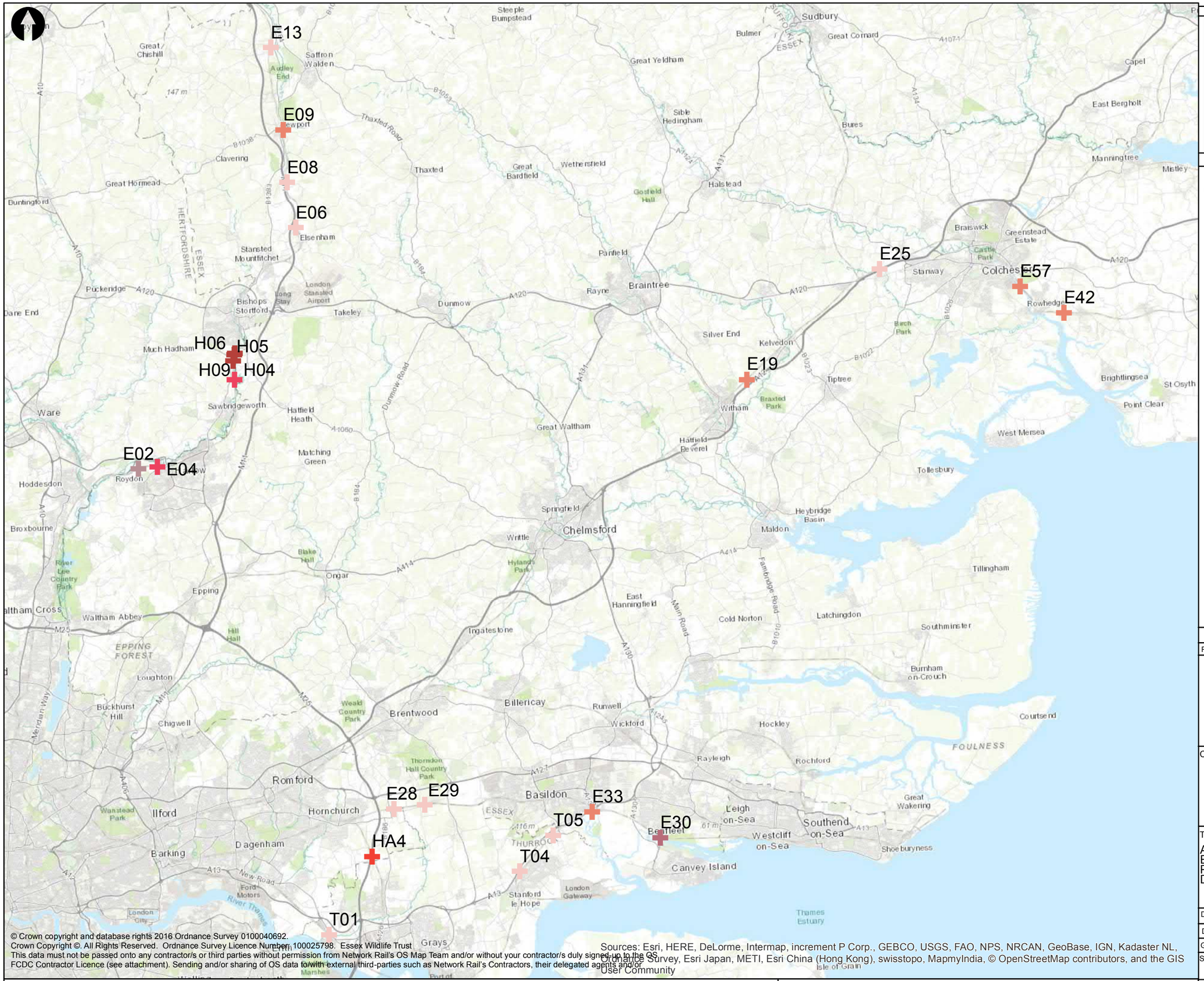
The information in this section relates to species assessed within this document as having the potential to be affected by the development and is a summary version of the full legislative text only. The acts described to in this section should be referred to for the full legislative text.

Table 2: Summary of legislation

Species	Legislation
European Badger	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.
Bats	All bat species found in the UK are fully protected as EPS under the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012). It is an offence to deliberately capture, injure or kill a bat; deliberately disturb a bat; or damage or destroy a breeding site or resting place used by a bat (whether or not the bat is present in that resting place). Bats are also protected in the UK under the Wildlife and Countryside Act 1981 (as amended). This means It is an offence to intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb a bat in such a place. Seven species are also listed on Section 41 of the NERC Act 2006.
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); it is an offence to disturb Schedule 1 birds at or near the nest or the dependant young of Schedule 1 birds. This can include pairing behaviour occurring prior to nesting.
Great Crested Newt and other Amphibians	Great crested newts are fully protected as EPS under the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012). It is an offence to deliberately capture, injure or kill a great crested newt; deliberately disturb a great crested newt; deliberately take or destroy its eggs; or damage or destroy a breeding site or resting place used by a great crested newt. Great crested newts are protected under the Wildlife and Countryside Act 1981 (as amended)). Under this act it is an offence to intentionally or recklessly obstruct access to any structure or place used for shelter or protection or disturb a great crested newt in such a place. 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).
Hazel Dormouse	Hazel Dormouse are fully protected as EPS under the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012) and are protected under the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally kill, take or injure a dormouse; possess or control a dormouse; intentionally or recklessly cause damage, destruction or obscure access to any structure or place used by dormice for shelter or protection and intentional or reckless disturbance of dormice. Hazel Dormouse are also listed under Section 41 of the NERC Act (2006).
European Otter	Otter are fully protected as EPS under Conservation of Habitats and Species Regulations 2017 (SI 2017/1012) and are protected under the Wildlife and Countryside Act 1981 (as amended). It is illegal to deliberately or recklessly kill, injure or take (capture) an otter; deliberately or recklessly disturb or harass an otter; and damage, destroy or obstruct access to a breeding site or resting place of an otter (i.e. an otter shelter). Otter are also listed under Section 41 of the NERC Act (2006).
Common 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, slow-worm, grass snake and adder
European Water vole	Water vole are protected under the Wildlife and Countryside Act 1981 (as amended). it is an offence to intentionally or recklessly cause damage, destruction or obscure access to any structure or place used by a water vole for shelter or protection; to intentionally or recklessly disturb a water vole while occupying such a place; or to intentionally kill or injure a water vole. Water vole are also listed under Section 41 of the NERC Act (2006).
Other mammals	All wild mammals are also protected from intentional inhumane treatment under the Wild Mammals (Protection) Act (1996). European hedgehogs are listed on Section 41 of the NERC Act 2006.

Species	Legislation
White-clawed Crayfish	White-clawed crayfish are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This means it is prohibited to intentionally kill, injure or trade. They are also listed on Section 41 of the NERC Act 2006.
Non-native Invasive Animal Species	Under Schedule 9 Part 1 of the Wildlife and Countryside Act 1981 (as amended) it is an offence to release, or allow the escape of alien animal species.
Non-native Invasive Plant Species	It is an offence to plant or otherwise cause to grow in the wild invasive non-native plants listed on Schedule 9 Part 2 of the Wildlife and Countryside Act 1981 (as amended).

B. Maps



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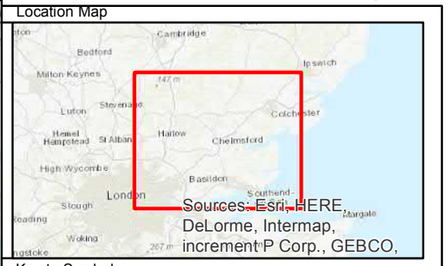

Key to Symbols

Crossings which potentially impact designated sites/ proirity habitats

- Hedgerows
- Local Wildlife Sites (LoWS)
- Sites of Importance for Nature Conservation (SINC)
- Site of Special Scientific Interest (SSSI)
- LoWS and Hedgerows
- SSSI and LoWS
- SSSI, LoWS, and Hedgerows

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	18/10/17	RB	For Information	BE	RDS

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Title

Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
Designated sites and proirity habitats

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

Scale at A3	Status	Rev	Security
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Drawing Number
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Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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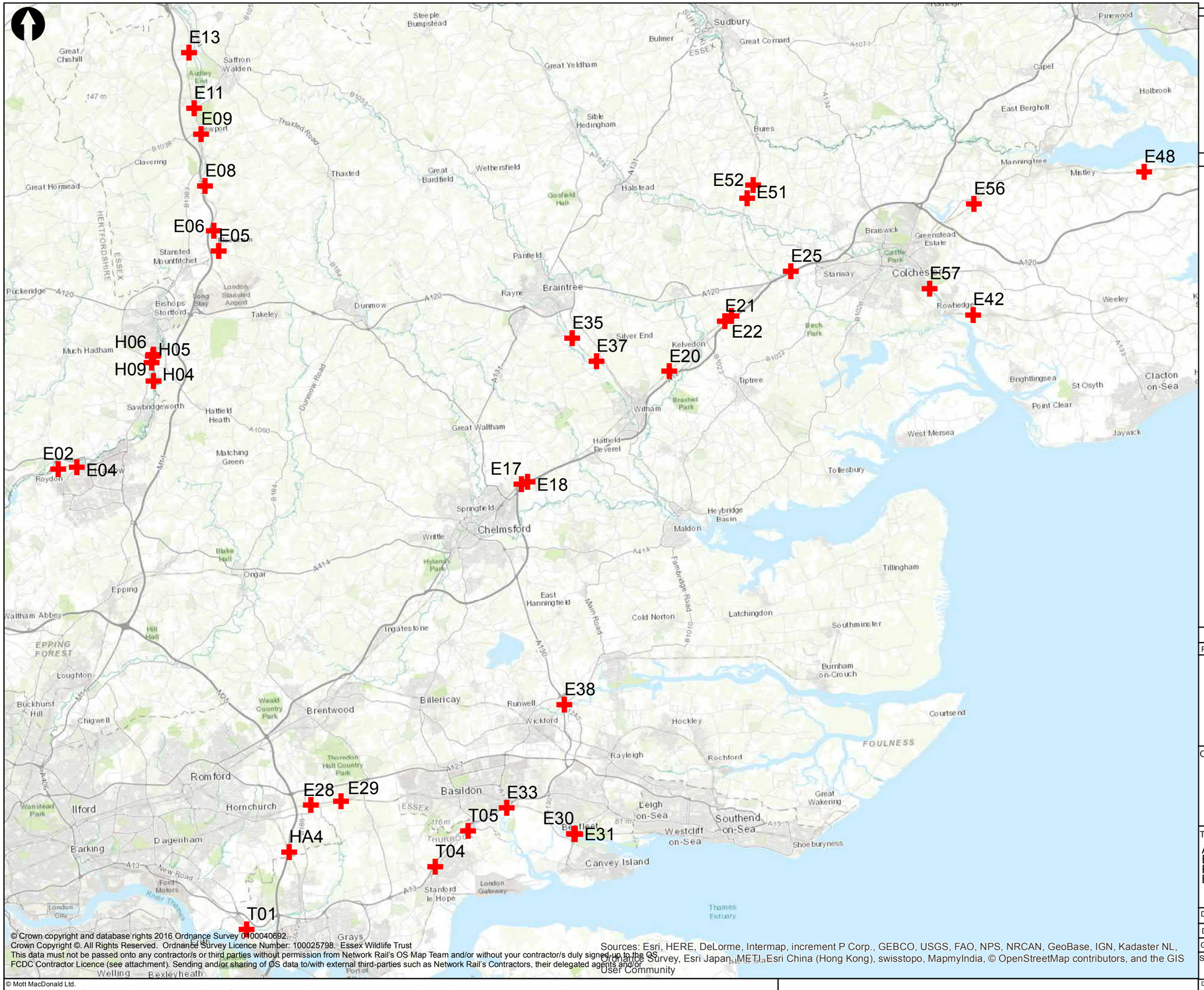

Location Map

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO,

Key to Symbols

✚ Crossings with potential for Badger

Rev	Date	Drawn	Description	Ch'k'd	App'd
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Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
Badger

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

Scale at A3	Status	Rev	Security
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Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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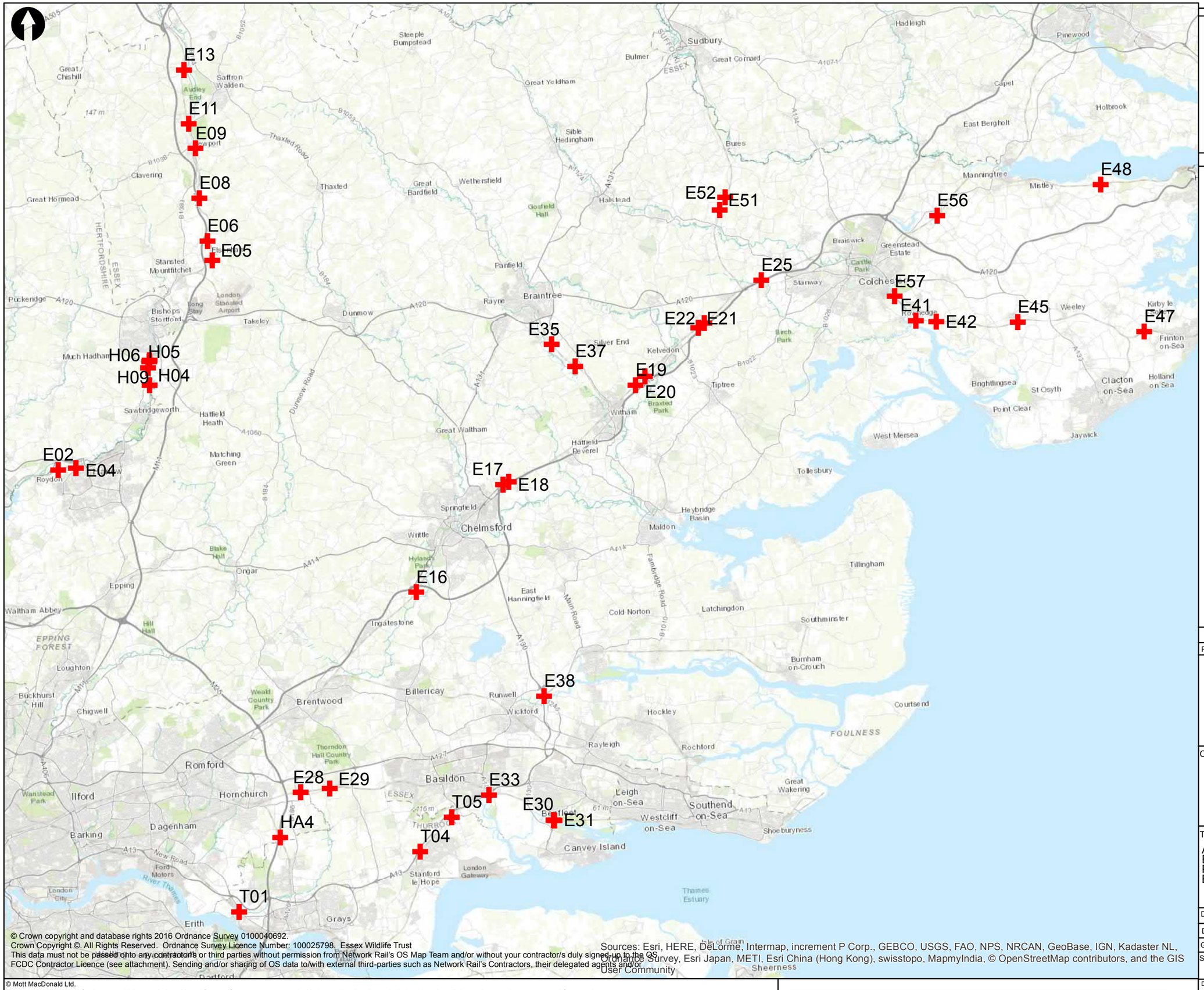

Location Map

Key to Symbols

Crossings with potential for Bats

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Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
Bats

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

Scale at A3	Status	Rev	Security
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Drawing Number
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Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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Location Map

Key to Symbols

Crossings with potential for Breeding Birds

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Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
Breeding Birds

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

Scale at A3	Status	Rev	Security
1:256,262	PRE	A	STD

Drawing Number
367516-MMD-00-XX-GIS-Y-

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Location Map

Key to Symbols

Crossings with potential for Great Crested Newt

Rev	Date	Drawn	Description	Ch'k'd	App'd
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Anglia Level Crossing Reduction Strategy
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Great Crested Newt

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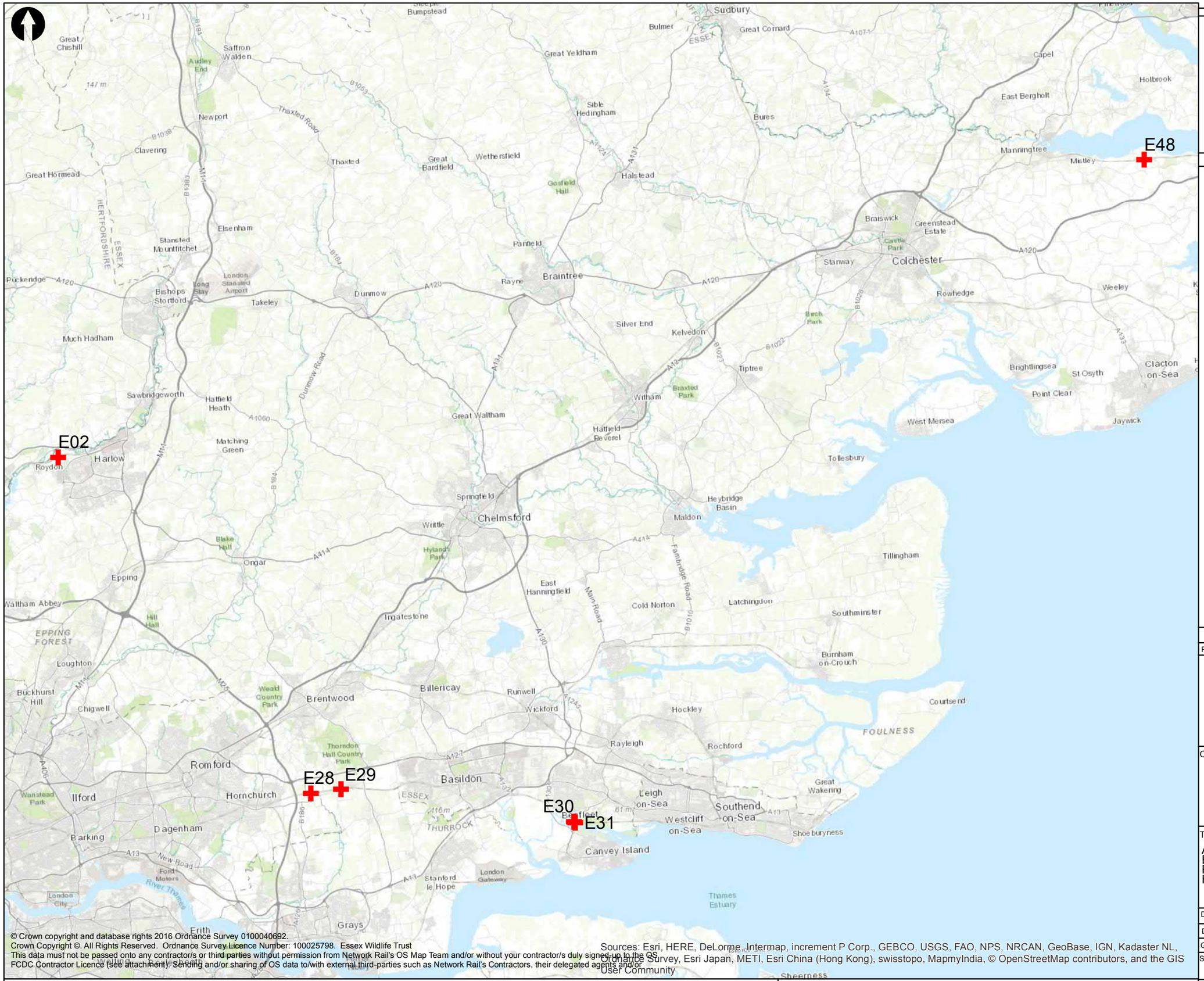

Location Map

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO,

Key to Symbols

✚ Crossings with potential for Hazel Dormouse

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Title

Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
Hazel Dormouse

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

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Drawing Number
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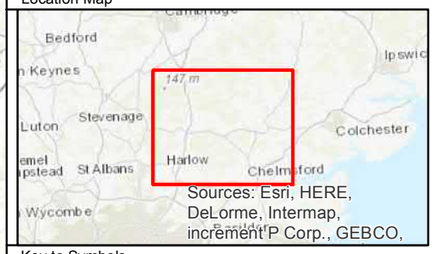
Location Map



Key to Symbols

Crossings with potential for Otter

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Title

Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
Otter

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

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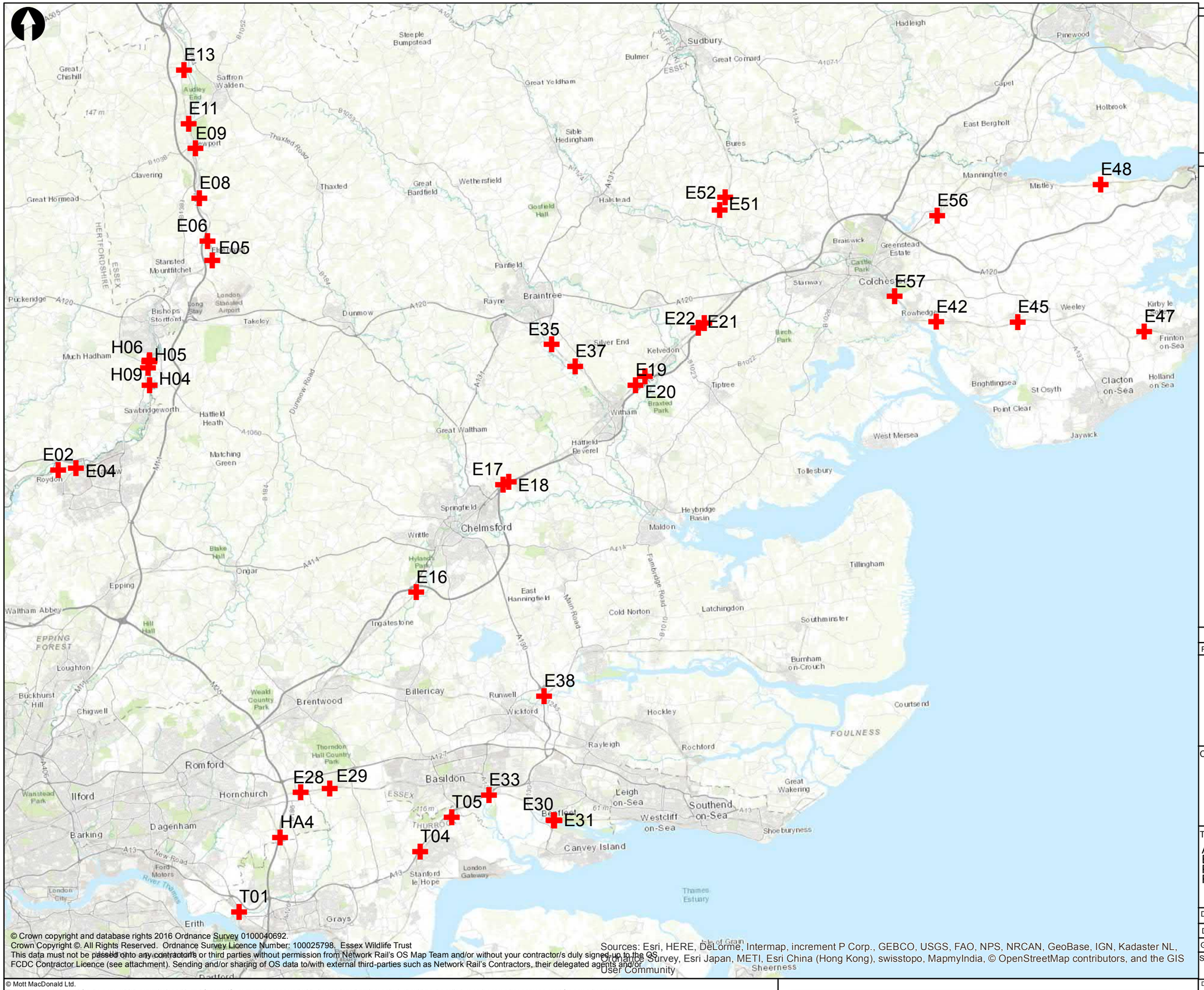

Location Map

Key to Symbols

Crossings with potential for Reptiles

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	06/10/17	RB	For Information	BE	RDS

Mott MacDonald
22 Station Road
Cambridge, CB1 2JD
United Kingdom
T +44 (0)01223 463500
W mottmac.com

Client

Network Rail

Title

Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
Reptiles

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

Scale at A3	Status	Rev	Security
1:256,262	PRE	A	STD

Drawing Number
367516-MMD-00-XX-GIS-Y-

0 3,375 6,750 13,500 20,250 27,000 Meters

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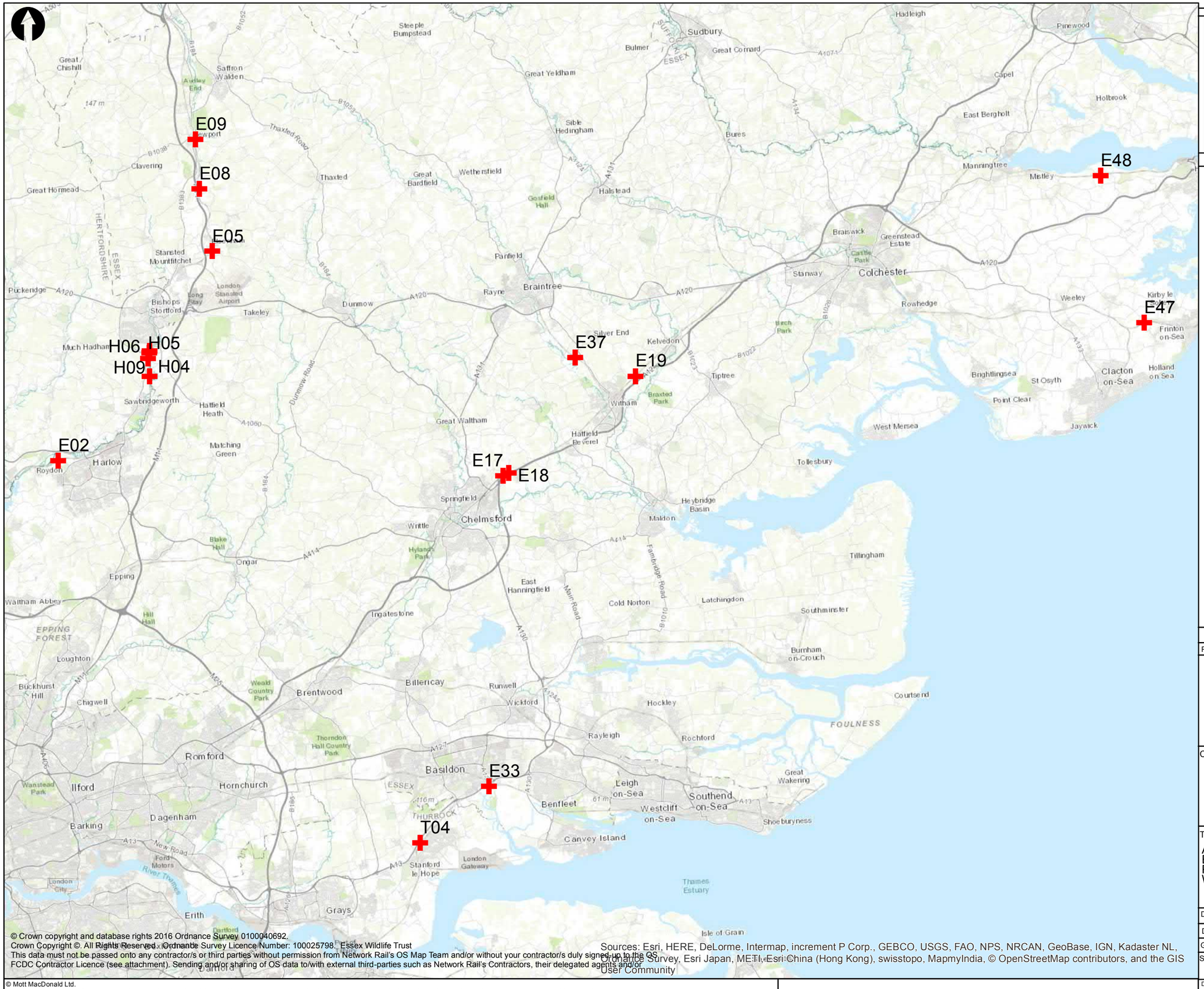
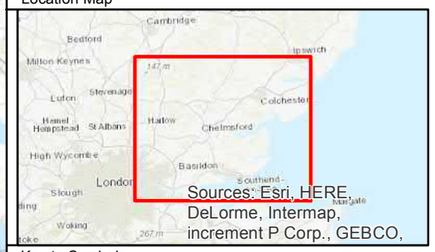


Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Location Map



Key to Symbols

Crossings with potential for Water vole

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	06/10/17	RB	For Information	BE	RDS

Mott MacDonald
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Client

Network Rail

Title

Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
Water vole

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

Scale at A3	Status	Rev	Security
1:256,262	PRE	A	STD

Drawing Number
367516-MMD-00-XX-GIS-Y-

0 3,375 6,750 13,500 20,250 27,000 Meters

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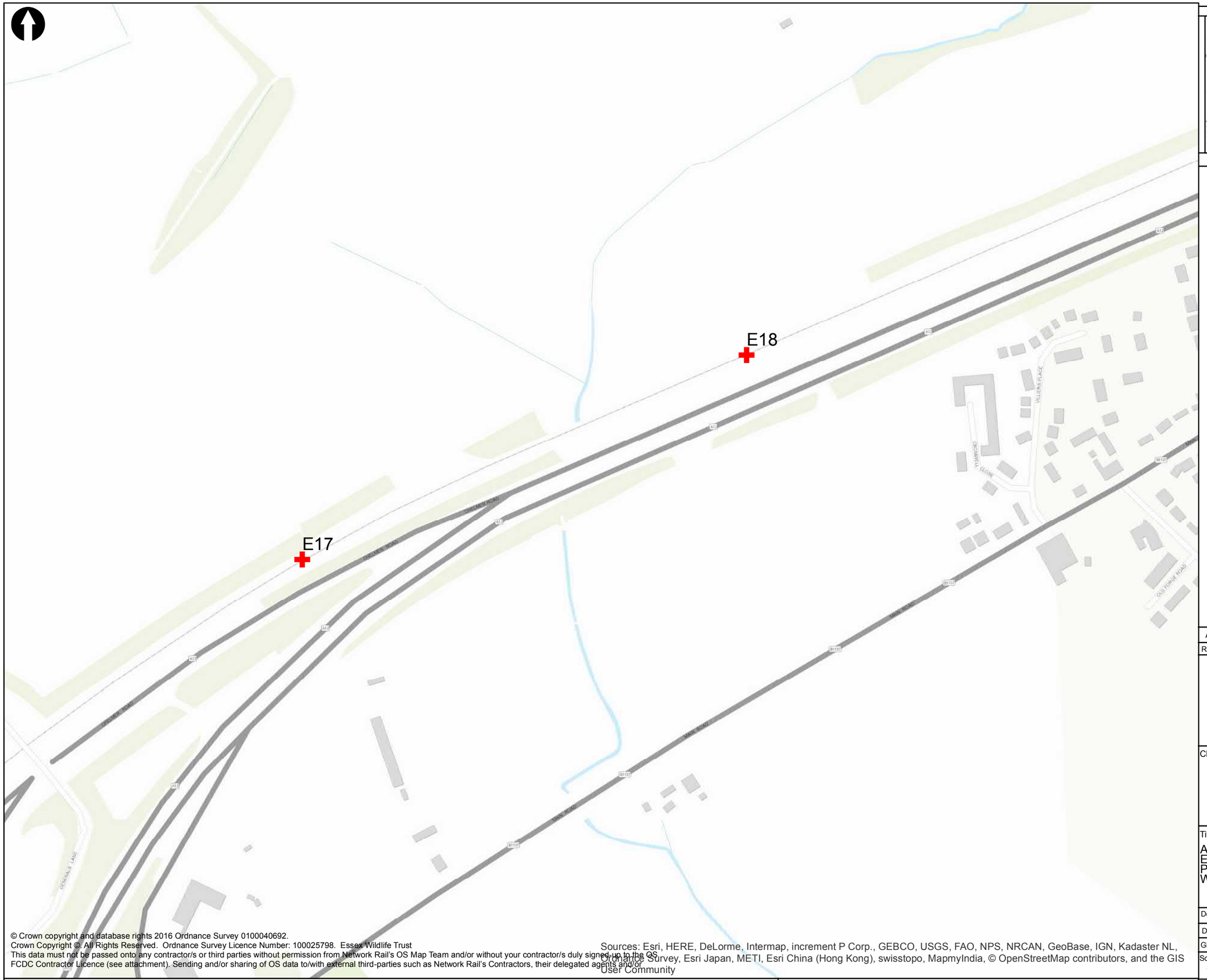
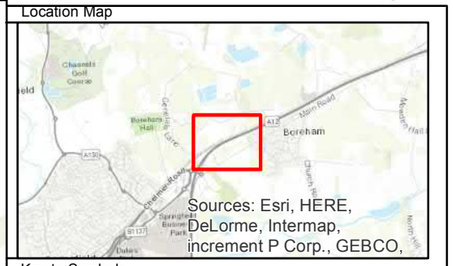


Location Map



Key to Symbols

Crossings with potential for White-clawed crayfish

Rev	Date	Drawn	Description	Ch'k'd	App'd
A	10/10/17	RB	For Information	BE	RDS

Mott MacDonald
22 Station Road
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Client

Network Rail

Title

Anglia Level Crossing Reduction Strategy
Essex and Others
Precautionary Method of Works:
White-clawed crayfish

Designed	R.Bhavsar		Eng Check	B. Ellis	
Drawn	R.Bhavsar		Coordination	B. Ellis	
GIS Check	D. Tinning		Approved	R. D. Sandifer	

Scale at A3	Status	Rev	Security
1:3,259	PRE	A	STD

Drawing Number
367516-MMD-00-XX-GIS-Y-

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

0 40 80 160 240 320 Meters

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C. Great Crested Newt Rapid Risk Assessment

C.1 Is a mitigation licence required?

C.1.1 Background

The template for the Natural England Method Statement used for development licensing purposes (Natural England, 2015) includes a Rapid Risk Assessment Tool, which provides an initial estimate of the potential risk of the proposed works resulting in an offence being a committed under the Conservation of Habitats and Species Regulations 2017 (SI 2017/1012) and therefore requiring mitigation and/ or a licence from Natural England.

Given that great crested newts can disperse over 1km from breeding ponds, the potential for offences may seem vast, yet the probability of an offence outside the core breeding and resting area is often rather small, and even if an offence takes place, the effect on the population may be negligible.

C.1.2 Method and limitations

The simple risk assessment tool (Table C.1) has been used to as part of the process to inform the decision as to whether to apply for a licence. The impacts of the works without any licensed mitigation were considered and a likely effect was selected for each "component".

This risk assessment tool was used as a general guide only and has been used following a site-specific risk assessment informed by field surveys of the crossings. Maps of each crossing and associated proposed works and all waterbodies within a 250m radius are presented in Essex and Others Ecology Constraints (Mott MacDonald, 2017). A careful comparison using the survey results and development plans was carried out to also inform the decision to whether a licence should be obtained.

Each crossing is different and the risk assessment tool does not include all factors (such as population size, terrestrial habitat quality, presence of dispersal barriers, timing and duration of works or detailed layout of development in relation to newt resting and dispersal).

The following factors could increase the risk of committing an offence:

- Large population size;
- High pond density;
- Good terrestrial habitat;
- Low pre-existing habitat fragmentation;
- Large development footprint; or
- Long construction period.

The following factors could decrease the risk:

- Small population size;
- Low pond density;
- Poor terrestrial habitat;
- Substantial, pre-existing dispersal barriers;

- Small development footprint; or
- Short construction period.

These factors were considered during mitigation design.

C.1.3 Table C.1. Rapid Risk Assessment Tool

Component	Likely effect	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	0.001 - 0.01 ha lost or damaged	0.05
Land 100-250m from any breeding pond(s)	0.001 - 0.01 ha lost or damaged	0.005
Land >250m from any breeding pond(s)	0.01 - 0.1 ha lost or damaged	0.001
Individual great crested newts	No effect	0
	Maximum:	0.05
Rapid risk assessment result:	**GREEN: OFFENCE HIGHLY UNLIKELY**	

C.1.4 Risk assessment results

The assessment result from Table C.1 indicates that the proposed works are of such a type, scale and location that it is highly unlikely any offence would be committed should the development proceed. Therefore, no licence would be required. Bearing in mind that this is a generic assessment, the specific plans for each crossings and proposed route have also been carefully examined to ensure this is a sound conclusion.

In addition, precautions to avoid offences have also been taken (See Section 4.2.5). It is likely that any residual offences would have negligible impact on conservation status, and enforcement of such breaches is unlikely to be in the public interest.

D. Contact details

Once ecological consultant for the works is known, contact details are to be added in the table below.

Contact Name	Role	Mobile Number	E-Mail

E. Toolbox Talk Attendance

Anglia Rail Level Crossings

Name	Company	Role	Date	Signature