HIGHWAYS AGENCY

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A14 Cambridge to Huntingdon improvement scheme

Environmental Statement Appendices

Appendix 11.11: Compliance with protected and controlled species legislation

Date: December 2014

6.3

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Executive summary

This report is an appendix of the *A14 Cambridge to Huntingdon improvement scheme Environmental Statement (ES)*. It sets out the scheme's compliance with legislation relevant to protected and controlled species that could be potentially affected. A description of the impacts on and mitigation for nature conservation is provided in *Chapter 11 of the ES.*

This report details how the scheme would be delivered in compliance with all relevant legislation for protected and controlled species. Compliance with the relevant legislation has been a key element of the ecological impact assessment of the scheme. A phased approach has been taken in assessing the ecological interest of the scheme and this involved desk-based reviews and updating field surveys in 2013 and 2014.

Detailed ecological impact assessment for the scheme has identified that the scheme may result in potential impacts involving the following protected and controlled (or non-native invasive) species:

- great crested newt;
- reptiles;
- birds (including breeding birds, wintering birds and *Schedule 1* species barn owl and kingfisher);
- badger;
- bats;
- water vole;
- otter;
- freshwater fish; and
- the controlled species Japanese knotweed, New Zealand pigmyweed, Canadian pondweed and signal crayfish.

The *ES* concluded that there would not be a significant effect on the conservation status of any of the European protected species and other protected species found in this scheme. It has been determined that the scheme would be delivered in full compliance with all relevant legislation for the identified protected and controlled species.

Appendix 20.1 should be read in conjunction with this appendix and this also reflects the commitment to ensuring compliance mitigation is appropriate and robust and is implemented in full.

Consultations with regulators and key stakeholders, including Natural England, have been undertaken and would be continued to ensure licencing for protected species where required and mitigation measures are addressed appropriately and in compliance.

Licensing would be required for works relating to a number of European protected species and other protected species, including great crested newt, barn owl, badger and bats. Pre-construction surveys would be undertaken for other species and the results would inform appropriate mitigation measures, for example, there would be a requirement for licencing work in relation to water vole and otter if pre-construction surveys confirm presence.

The management of controlled species is also critical on this scheme and an invasive species control method statement would guide implementation of mitigation to ensure full legislative compliance.

1 Introduction

1.1.1 This report is an appendix of the *A14 Cambridge to Huntingdon improvement scheme Environmental Statement (ES)*. It sets out the scheme's compliance with legislation relevant to protected and controlled species that could be potentially affected.

1.1.2 A phased approach has been taken in assessing the ecological interest of the scheme. This involved a desk-based study and review of previous work undertaken in relation to the scheme prior to 2014 and subsequent detailed baseline surveys and assessments as required. The results of these surveys, assessments and consultations form the basis of the detailed ecological impact assessment presented in *Chapter 11 of the ES*.

1.1.3 The ecological impact assessment has identified that the scheme may result in potential impacts involving the following protected and controlled (or non-native invasive) species:

- great crested newt (*Triturus cristatus)*;
- reptiles;
- birds, including breeding birds, wintering birds and *Schedule 1* species
- badger (*Meles meles)*;
- bats;
- water vole (*Arvicola amphibious)*;
- otter (*Lutra lutra)*;
- freshwater fish; and
- the controlled species Japanese knotweed (*Fallopia japonica)*, New Zealand pigmyweed (*Crassula helmsii),* Canadian pondweed (*Elodea canadensis)* and signal crayfish (*Pacifastacus leniusculus*) (Controlled Species).

1.1.4 This technical appendix details how the scheme would comply with the legislation relevant to these protected and controlled species. It provides information on these species, which can be read in conjunction with *Chapter 11 of the ES* and associated appendices and figures.

1.1.5 The structure of this report is provided in *Table 1.1*.

Table 1.1: Structure of this report

Report section	Overview
Relevant legislation	Outline of relevant European, national and species-specific legislation.
Methodology	An overview of the approach to this report and to the ecological impact assessment for the scheme.
Presence of protected and controlled species	Information on all protected and controlled species that were identified or could be potentially affected by the scheme.
Potential to cause offences	An overview of the potential impacts that could occur in the absence of the established licensing requirements and proposed mitigation measures.
Licensing requirements	Identification of all licensing and legislative requirements for protected and controlled species that would be required by the scheme prior to and during construction.
Compliance mitigation	A summary of mitigation measures for protected and controlled species in terms of legislative compliance.
Conclusions	A summary of the findings of this report.

2 Relevant legislation

2.1 Section overview

2.1.1 This section outlines the relevant legislation at European, national and species-specific levels.

2.2 Overview of key legislation

2.2.1 Protection of ecology and nature conservation is guided and influenced by a number of existing plans, programmes and strategies produced in the UK. These have been developed at the European, national, regional and local levels seeking to enhance the essential role of biodiversity and ecology for sustainable development.

2.2.2 This document focuses on the following legislative instruments relevant to the scheme in order to ensure compliance and can be read in conjunction with *Chapter 11 of the ES*:

European

- *The Convention on the Conservation of European Wildlife and Natural Habitats (1979);*
- *Convention on the Conservation of Migratory Species of Wild Animals (1983);*
- *Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended*) ;
- *Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment 1985*, *as amended in 1997 (Council Directive 97/11/EC), 2003 (2003/35/EC) and 2009 (2009/31/EC), codified version 2011/92/EU (the EIA directive*) and currently proposed for further amendment;
- *Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora 1992 (the Habitats Directive)*;
- *Directive 2004/35/EC on environmental liability with regard to the prevention and remediation of environmental damage 2004 (the Environmental Liability Directive);*
- *Council Directive 2000/60/EC European Water Framework Directive 2000 (2000/60/EC);* and
- *Regulation (EU) 1100/2007 (OJ:L248/17/2007 on measures for the recovery of the stock of European eels transposed into UK law as The Eel (England and Wales) Regulations 2009.*

National

- *The Conservation of Habitats and Species Regulations 2010 (as amended) 2012 S.I. 2012/1927;*
- *The Wildlife & Countryside Act 1981 (as amended);*
- *Countryside and Right of Way Act (2000);*

- *The Protection of Badgers Act (1992); and*
- *Salmon and Freshwater Fisheries Act 1975.*

2.3 European legislation

The Convention on the Conservation of European Wildlife and Natural Habitats (1979)

2.3.1 The Bern Convention on the Conservation of European Wildlife and Natural Habitats is a binding international legal instrument in the field of nature conservation. It covers natural heritage in Europe, as well as in some African countries.

2.3.2 It is particularly focused on the protection of natural habitats and endangered species, including migratory species. The convention has three main aims: to conserve wild flora and fauna and their natural habitats; to promote co-operation between states; and to give particular attention to endangered and vulnerable species, including endangered and vulnerable migratory species.

Convention on the Conservation of Migratory Species of Wild Animals (1983)

2.3.3 This convention aims to conserve terrestrial, marine and avian migratory species throughout their range.

Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended)

2.3.4 *The Birds Directive* provides for part implementation of the *Bern Convention* and the *Bonn Convention*. Member states are required to maintain the favourable conservation status of all wild bird species across their distributional range and provide general protection to all wild birds. This is implemented in the UK through the *Wildlife and Countryside Act 1981 (as amended*). *The Directive* also requires the designation of protected sites for rare or vulnerable species and migratory species of bird to form a European network of protected sites.

Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment 1985, as amended in 1997 (Council Directive 97/11/EC), 2003 (2003/35/EC) and 2009 (2009/31/EC), codified version 2011/92/EU (the EIA directive) and currently proposed for further amendment;

2.3.5 Member states are required to assess the environmental effects of public and private developments and other projects which are likely to have significant effects on the environment before consent is given. The assessment must include assessment of impacts on flora and fauna. This Directive is implemented throughout the UK. The directive has been implemented in the UK through various pieces of legislation including the *Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2012.*

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora 1992 (the Habitats Directive)

2.3.6 *The Habitats Directive*, as it is referred to in the UK, provides for part implementation of the *Bern Convention*. Member States are required to implement legislation to designate a network of protected sites and maintain their ecological integrity.

2.3.7 Certain species are also protected through this Directive under three annexes:

- *Annex IIa* - designation of protected areas required within the natural range of the animal species listed;
- *Annex IVa* - special protection required for the native animal species listed; and
- *Annex Va* - exploitation of listed animal species to be subject to management if necessary in order to maintain their favourable conservation status.

Council Directive 2004/35/EC on environmental liability with regard to the prevention and remediation of environmental damage 2004 (the Environmental Liability Directive)

2.3.8 This directive seeks to achieve the prevention and remediation of environmental damage, specifically: damage to habitats and species protected by EC law, and other habitats and species designated by member states; damage to water resources; and land contamination which presents a threat to human health.

Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy (Water Framework Directive)

2.3.9 This Directive was adopted and came into force in December 2000. The purpose of the Directive is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater. It would ensure that all aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands meet 'good status' by 2015.

Regulation (EU) 1100/2007 (OJ:L248/17/2007) on measures for the recovery of the stock of European eel

2.3.10 This Regulation establishes a framework for the protection and sustainable use of the stock of European eel (*Anguilla anguilla*). *The Eels (England and Wales) Regulations 2009* came into force in England and Wales on 15 January 2010 and implements the measures as set out in the EU Regulation.

2.4 National legislation

The Conservation of Habitats and Species Regulations 2010 2010 SI 2010/490 (as amended)

2.4.1 The *Conservation of Habitats and Species (Amendment) Regulations 2012* amend the *Conservation of Habitats and Species Regulations 2010 SI 2010/490* (as amended). They place new duties on public bodies to take measures to preserve, maintain and re-establish habitat for wild birds.

2.4.2 *Schedule 2 of the Regulations* lists those species of animals included in *Annex IV(a) to the Habitats Directive* that have a natural range that includes any area in the UK.

The Wildlife & Countryside Act 1981 (as amended)

2.4.3 This Act is the principal piece of UK legislation relating to the protection of wildlife. It gives protection to native species (especially those at threat), controls the release of non-native species, enhances the protection of Sites of Special Scientific Interest (SSSIs) and builds upon the rights of way rules in the *National Parks and Access to the Countryside Act 1949* (see also under species-specific legislation below).

Countryside and Rights of Way Act (CRoW) 2000

2.4.4 *Countryside and Rights of Way Act (CRoW) 2000* introduces some amendments to the *Wildlife and Countryside Act 1981* and outlines the importance of biodiversity conservation by giving it a statutory basis, requiring government departments to have regard for biodiversity in carrying out its functions and to take positive steps to further the conservation of listed species and habitats.

2.4.5 The act strengthens legal protection for threatened species and brings up to date the *Wildlife and Countryside Act 1981*. This assists in bringing offenders to justice, and provides for stronger penalties.

The Protection of Badgers Act (1992)

2.4.6 *The Protection of Badgers Act 1992* makes it an offence to kill, injure or take a badger, or to damage or interfere with a sett unless a licence is obtained from a statutory authority (see also under species-specific legislation below).

The Salmon and Freshwater Fisheries Act (1975)

2.4.7 The *Salmon and Freshwater Fisheries Act (1975)* regulates the movement, killing and obstruction of fish and also focuses on the obstruction of waterways and the impact on migratory fish species (see also under species specific legislation below).

2.5 Species-specific legislation

Great crested newt

2.5.1 The great crested newt is fully protected under Schedule 5 of the *Wildlife and Countryside Act 1981* (as amended) and *Schedule 2* of the *Conservation of Habitats and Species Regulations 2010* (as amended) making it a European protected species. It is an offence to intentionally kill, injure to disturb a great crested newt, to possess one (whether live or dead), or sell or offer for sale without a licence. It is also an offence to intentionally or recklessly damage, destroy and disturb great crested newt in any place used for shelter or obstruct access to such areas.

2.5.2 The legislation covers all newt life stages such that eggs, juvenile and adult newts are equally protected (*Standing Advice Species Sheet: Great crested newts* (Natural England, undated a)).

2.5.3 Great crested newt is listed on Appendix II of the Bern Convention and on Annexes II and IV of the EU Natural Habitats Directive.

2.5.4 Great crested newt and their breeding sites or resting places are protected under *Regulation 41 of the Conservation of Habitats and Species Regulations 2010*.

Reptiles

2.5.5 All six species of reptile native to the UK are protected under the *Wildlife and Countryside Act 1981 (as amended)* and benefit from various levels of protection. The adder (*Vipera berus)*, grass snake (*Natrix natrix)*, slow-worm (*Anguis fragilis)* and common lizard (*Zootoca vivipara)* receive partial or full protection under *Section 9* of the *Wildlife and Countryside Act 1981 (as amended)*. This legislation makes it an offence to:

- intentionally or recklessly kill or injure these animals; and
- sell, offer for sale, possess or transport for the purpose of sale or publish advertisement to buy or sell individual reptiles.

2.5.6 Additional protection is afforded to the smooth snake (*Coronella austriaca)* and sand lizard (*Lacerta agilis)*, however, these species are not present on the scheme and therefore legislation in relation to these two additional species are not considered further.

Birds

2.5.7 The *Wildlife and Countryside Act 1981 (as amended)* provides varying degrees of protection to all wild birds at any time of year. In particular, the eggs and nest of any wild bird are protected from being damaged, destroyed or taken, and disturbance of birds building or using a nest is prohibited. Species listed on *Schedule 1 of the Act* are specially protected.

2.5.8 The *Conservation of Habitats and Species Regulations 2010 (as amended)* require competent authorities to restrict or revoke permission for a scheme where the integrity of a European protected site (a site protected under European legislation) would be adversely affected. This provision applies to the designation features protected for their bird species/communities.

2.5.9 Additionally, some species are specially protected on *Schedule 1* of the *Wildlife and Countryside Act 1981 (as amended)* from intentional or reckless actions that may cause disturbance while they are nest building, at a nest when they have eggs or dependant young or disturb the dependent young of that bird. Such species relevant to the current scheme include barn owl (*Tito alba*) and kingfisher (*Alcedo atthis*).

2.5.10 Since barn owls do not build a nest but instead lay their eggs on a flat surface known as a scrape, the disturbance is considered liable to prosecution once the first egg is laid (The Barn Owl Trust, 2012).

Badger

2.5.11 The *Protection of Badgers Act 1992* legally protects badgers from intentional cruelty (such as badger-baiting) and from the results of lawful human activities (such as housing, road or other developments).

2.5.12 Badgers are listed in *Schedule 6 of the Wildlife and Countryside Act 1981 (as amended)* which prohibits the use of certain methods of taking or killing a wild animal.

2.5.13 The *Protection of Badgers Act 1992* allows for licences to be issued for a number of purposes, including development to interfere with badger setts or disturb badgers. Licences are issued by Natural England.

2.5.14 Setts are only protected when in 'current use'. Natural England provides the following guidance on defining current use *Guidance on 'Current Use' in the definition of a Badger Sett* (Natural England, 2009a):

> *'As long as there are signs present indicating "current use" the sett is defined as such in the Act and is therefore protected. The maximum lapse of time between last occupation by badgers and the inspection of a sett for it to be considered in "current use" is how long it takes the signs to disappear, or more precisely, to appear so old as to not indicate "current use".'*

Bats

2.5.15 All species of bats and their breeding sites or resting sites (roosts) are protected under *Schedule 5 of the Wildlife and Countryside Act 1981* (as amended) and *Schedule 2* of the *Conservation of Habitats and Species Regulations 2010* (as amended) which makes each a European protected species. It is an offence to intentionally kill, injure or capture a bat, to possess a bat (whether live or dead) or any part of a bat, or sell or offer for sale without a licence. It is also an offence to intentionally damage or destroy any place used by bats for shelter, whether they are present or not and to intentionally or recklessly disturb a bat in its roost or obstruct access to a bat roost.

Water vole

2.5.16 The water vole is fully protected under *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended).

2.5.17 On 6 April 2008 water vole received an increased level of protection, becoming fully covered by the provisions of *Section 9 of the Wildlife and Countryside Act 1981 (as amended)*. Prior to this the water vole was only covered by *Section 9(4)* and had limited legal protection.

2.5.18 Legal protection makes it an offence to:

- intentionally kill, injure or take (capture) a water vole;
- possess or control a live or dead water vole, or any part of a water vole;
- intentionally or recklessly damage, destroy or
- obstruct access to any structure or place which water vole use for shelter or protection or disturb water vole while they are using such a place; and
- sell, offer for sale or advertise for live or dead water vole.

Otter

2.5.19 The otter is fully protected under *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended) and *Schedule 2* of the *Conservation of Habitats and Species Regulations 2010* (as amended) making it a European protected species. Otters and their resting places are fully protected; it is an offence to deliberately capture, injure or kill them or to damage, destroy or obstruct their breeding or resting places. It is also an offence to disturb otters in their breeding or resting places.

2.5.20 There is, however, provision within the legislation to kill, take, disturb or possess otters or to use prohibited methods to kill or take under a licence in certain defined circumstances, if the issue cannot be resolved by any alternative means.

Freshwater fish

2.5.21 Fish species are afforded protection under one or more of the following conservation legislative frameworks:

- *European Habitats Directive (92/43/EEC) and Conservation of Habitats and Species Regulations 2010;*
- *European Water Framework Directive 2000 (2000/60/EC);*
- *The Eels (England and Wales) Regulations 2009; and*
- *Salmon and Freshwater Fisheries Act 1975;*

2.5.22 Atlantic salmon (Salmo salar), bullhead, sea lamprey (Petromyzon marinus), river lamprey (Lampetra fluviatilis), brook lamprey (Lampetra planeri) and spined loach (Cobitis taenia) are all listed in Annex II of the EC Habitats Directive which requires the designation of Special Areas for Conservation (SAC). Of these species only spined loach and bullhead would be expected within the vicinity of the scheme.

2.5.23 Atlantic salmon and river lamprey are also listed on *Annex V of the EC Habitats Directive,* which lists species whose taking in the wild and exploitation may be subject to management measures.

2.5.24 European eel receives protection under the *Eels (England and Wales) Regulations 2009,* which outlines, amongst other factors, fishing closed season for eels, construction and alteration of in-channel obstructions, eel passes on existing structures and screening of intakes and outfalls.

2.5.25 All freshwater fish species receive protection under the *Salmon and Freshwater Fisheries Act, 1975*. The *Salmon and Freshwater Fisheries Act* provides the framework for legislation relating to the input of polluting materials into watercourses, construction, alteration and removal of in-channel obstructions, closed season for fishing, licensing and enforcement.

Controlled species

2.5.26 For the purpose of this report, controlled species (or non-native invasive species) are those listed on *Schedule 9* of the *Wildlife and Countryside Act 1981 (as amended)*. Japanese knotweed, New Zealand pigmyweed, Canadian pondweed and signal crayfish are controlled species that have been identified in the study area. Under the Act, it is an offence to cause the spread of species which are listed under *Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).*

3 Methodology

3.1 Introduction

3.1.1 This section outlines the approach that has been taken to review the compliance of the scheme with protected and controlled species legislation. It also provides a brief overview of the approach taken to the ecological impact assessment, but should be read in conjunction with *Chapter 11 of the ES*.

Ecological impact assessment methodology

3.1.2 The ecological impact assessment that has been undertaken for the scheme has been based on and prepared in accordance with latest best practice: *Guidelines for ecological impact assessment in the United Kingdom*, (IEEM, 2006); *Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 4 – 'Ecology and Nature conservation'* (Highways Agency *et al.*, 1993); and *DMRB Interim Advice Note IAN 130/10; 'Ecology and Nature Conservation: Criteria for Impact Assessment'*, (Highways Agency *et al*., 2010). In addition, reference has been made to current best practice guidance documents for the survey and assessment of specific species and habitats, as referenced in subsequent sections, below.

3.1.3 This approach enabled the identification of protected species that could be potentially affected by the scheme. In addition, controlled species that could affect or be affected by the scheme were also identified.

3.1.4 Through the ecological impact assessment for the scheme, it was established that the following protected and controlled species would be potentially affected:

- great crested newt;
- reptiles;
- birds, including breeding birds, wintering birds and *Schedule 1* species (barn owl and kingfisher);
- badger;
- bats;
- water vole;
- otter;
- freshwater fish; and
- the controlled species Japanese knotweed, New Zealand pigmyweed, Canadian pondweed and signal crayfish.

3.1.5 The following sections outline the approach that was taken in identifying the presence of the species and the potential impacts in relation to causing an offence under the pertinent environmental legislation.

3.2 Great crested newt

3.2.1 Full details of the methodology of the great crested newt surveys are presented in *Appendix 11.4.*

3.2.2 Methodologies adopted for survey of great crested newt were designed to ensure that sufficient information was available to illustrate that activities associated with the scheme would be compliant with protected species legislation. Surveys were based on best practice guidance (*Great crested newt mitigation guidelines*; English Nature, 2001) and confirmed with Natural England during the scoping process.

3.2.3 Surveys were both desk-based, with data acquired from consultation with statutory and non-statutory conservation bodies, and field-based. The latter involved survey of ponds and ditches within 250m of the on-line scheme footprint and within 500m of the off-line footprint in order to identify great crested newt presence and population size (see *Figure 11.4)*. A total of 110 ponds and 220 ditches were surveyed.

3.2.4 All surveys were carried out at appropriate times of year by suitably qualified surveyors. Details of survey methodologies are to be found in *Appendix 11.4 of the ES*.

Limitations

3.2.5 Limitations specific to the surveys carried out included access being denied to certain areas along the scheme, and health and safety concerns in some areas, limiting the assessment and survey of some waterbodies.

3.2.6 In the 2014 surveys a number of waterbodies and ditches were not assessed during the initial assessments due to factors such as access issues and health and safety constraints.

3.2.7 Waterbodies that were surveyed may not have received the full number of surveys recommended in best practice guidelines or it may not have been possible to use three survey methods at each visit. The limitations to the surveys detailed above do not represent a significant constraint to adequately assessing the value of great crested newts for the purposes of an ecological impact assessment and the surveys are considered to be robust with a high degree of confidence in the outcomes.

3.3 Reptiles

3.3.1 Full details of all reptile survey methodology are presented in the *Reptile technical appendix* (*Appendix 11.5 of the ES*).

3.3.2 Records of reptiles and any sites designated for the presence of reptiles within 1km of the scheme were requested from the Cambridgeshire and Peterborough Environmental Records Centre (CPERC).

3.3.3 A review of baseline data conducted in 2013 for the scheme (Atkins, 2013b) and the database of incidental records of species of interest recorded during other surveys on the scheme were also reviewed for pertinent records.

3.3.4 Full details of the methodology employed for the reptile surveys are presented in *Appendix 11.5 of the ES*. A summary is presented in the following paragraphs.

3.3.5 Surveys were based on best practice guidance the *Herpetofauna Workers Manual* (JNCC, 2003) and from Sewell *et al.* (2013) and were conducted by suitably experienced ecologists.

3.3.6 Artificial cover objects (ACOs) were placed within suitable reptile habitats along the footprint of online sections of the scheme and in areas along the length of the offline section of the scheme in both 2013 and 2014. After a suitable period of habituation, the ACOs were surveyed, in suitable weather conditions, over an appropriate number of survey visits.

Limitations

3.3.7 It is considered in *Appendix 11.5* that there are no limitations that represent a significant constraint to the assessment.

3.4 Breeding birds

3.4.1 Full details of the methodology of the bird surveys are presented in the *Breeding Birds technical appendix* (*Appendix 11.6 of the ES)* and in the *Barn Owl confidential technical appendix* (*Appendix 11.7 of the ES*).

3.4.2 Methodologies adopted for survey of breeding and wintering bird populations were designed to ensure that sufficient information was available to illustrate that activities associated with the scheme would be compliant with protected species legislation.

3.4.3 Surveys were both desk-based, with data acquired from consultation with statutory and non-statutory conservation bodies, and field-based.

3.4.4 Breeding bird survey methodology was adapted from the *Breeding Bird Survey (BBS)* that has been developed by the British Trust for Ornithology (BTO) as a means of assessing national breeding bird populations. BBS enables determination of the presence of species that are specially protected under *Schedule 1* of the *Wildlife and Countryside Act 1981 (as amended)* or *Annex I* of the *Birds Directive*.

3.4.5 In addition, surveys were carried out specifically to determine the presence/ likely absence of barn owls.

3.4.6 Wintering bird surveys used a vantage point methodology, and records were accumulated for both diurnal and nocturnal use of the survey corridor by birds. Recording focussed primarily on wading birds, wildfowl and birds of prey (raptors), species groups that are collectively considered to be of highest conservation concern, and generally receive the highest level of protection under the legislation.

3.4.7 All surveys were carried out at appropriate times of year and in appropriate weather conditions by suitably qualified surveyors.

Limitations

3.4.8 The possibility that some areas of habitat supporting good assemblages of breeding birds may have been overlooked, particularly across the large expanse of arable habitat of the survey area, is considered to be low. It is considered that the data gathered is sufficient for the purposes of undertaking ecological impact assessment.

3.4.9 Barn owls may use different nest sites in consecutive years/nesting attempts, so that nest sites used by the species may not have been recorded as active during the survey period.

3.5 Badger

3.5.1 Full details of the methodology of the badger surveys are presented in the *Badger confidential technical appendix* (*Appendix 11.10 of the ES*).

3.5.2 Records of badgers within 1km of the scheme were requested from the Cambridgeshire and Peterborough Environmental Records Centre (CPERC). Cambridgeshire Mammal Group was contacted for records of badger setts and road casualties within 1km of the scheme.

3.5.3 An extensive desk-based review and collation exercise of all known badger records and survey data from along the scheme was carried out in 2013 and updated in 2014.

3.5.4 *Table 3.1* summarises the badger surveys carried out between 2003 and 2014. Full details of all badger surveys are presented in *Appendix 11.10 of the ES*.

Table 3.1: Badger survey during the period 2003 to the present time

2003-2010 survey	2013 update	2014 A1 survey
Survey: Baseline badger survey (2003/2004) 1km desk study – CPERC, Cambs Badger and Mammal Groups. Field survey to identify setts and field-sign in late 2007. Accessible areas within 500m of the scheme. No survey of Huntingdon viaduct area (as no badger evidence during Phase 1) Badger bait marking (2008/09). Revisited existing setts and surveyed for new setts between December 2009 and May 2010. Update survey report in 2010 **Exclusions:** Excluded Huntingdon viaduct area as no badger evidence observed during Phase 1. Excluded A1 widening section Brampton to Alconbury.	**Survey:** Field survey to identify setts and field-sign within 250m of scheme: Includes Huntingdon viaduct area. **Exclusions:** Excluded A1 widening section Brampton to Alconbury. No updated bait marking study in 2013.	**Survey:** 1km desk study of section between the Brampton Hut and Alconbury Junctions of the A1. CPERC and Cambridgeshire Badger and Mammal Groups. Field survey of 30m either side of the section between the Brampton Hut and Alconbury Junctions of the A1 in January 2014. Update surveys of setts not more than 100m from the scheme.

3.6 Bats

3.6.1 Full details of the methodology of the bat surveys are presented in *Appendix 11.9*.

3.6.2 Records of bats within 1km of the scheme were requested from the Cambridgeshire and Peterborough Environmental Records Centre (CPERC). Cambridgeshire Bat Group was contacted for records within 5km of the scheme.

3.6.3 An extensive desk-based review and collation exercise of all known bat records and survey data from along the scheme was carried out in 2013 and 2014.

3.6.4 Bat surveys between 2013 and 2014 included ground assessment of trees and structures (buildings, culverts and bridges), climbing of trees considered suitable to support roosting bats, dusk and dawn activity surveys of trees and structures, manual transects and automated static monitoring. These surveys were undertaken with reference to the Bat Conservation Trust (BCT) *Good Practice Guidelines* (Hundt, 2012), the *Design Manual for Roads and Bridges Volume 10, Section 4, Part 3 HA80/99 Nature Conservation Advice in Relation to Bats (DMRB HA80/99)* (Highways Agency *et al*., 2001a), *Factors Determining the Use of Culverts Underneath Highways and Railway Tracks by Bats in Lowland Areas* (Boonman, 2011) and where applicable, under licence from Natural England.

3.6.5 The surveys were undertaken in line with Hundt (2012) in terms of timing and conditions.

3.6.6 Sonograms of bat calls were analysed according to the methodology and information contained in *British Bat Calls: A Guide to Species Identification* (Russ, 2012). In the absence of guidance on criteria for allocating relative activity levels, bat activity indices were calculated for each static bat detector, as the number of passes per species for each survey period, divided by the number of nights within that survey period.

Bridge and culvert surveys

3.6.7 These surveys were undertaken with reference to Hundt (2012) and *DMRB HA80/99* (Highways Agency *et al*., 2001a). Boonman (2011) was also considered. A bat scoping survey was conducted by an experienced bat ecologist.

Daytime roost assessments of buildings

3.6.8 All buildings within 100m of the route alignment were scoped for their roosting potential by aerial photography, Ordnance Survey maps and, where access was permitted, external ground-based assessment. Emergence surveys were carried out on those buildings considered to have potential to support bats, where access was available following the guidance set out by Hundt (2012). The methodology was amended by considerations of proximity to the main route alignment and the potential for effects on bats.

Dusk emergence and pre-dawn re-entry surveys

3.6.9 Surveys were carried out during optimal weather conditions as set out by Hundt (2012). Sound recordings were made by surveyors during the surveys.

Assessment of trees

3.6.10 A survey area comprising a 100m buffer from the footprint of the scheme was investigated to identify all trees with the potential to support roosting bats. The methodology used for surveys was derived from best practice guidance (Hundt, 2012). All trees that were determined as requiring further survey, with potential roost features above 1.5m in height and considered to be safe to climb, were subject to a tree climbing survey by appropriately qualified and licensed ecologists (National Proficiency Tests Council (NPTC) CS38 tree climbing and aerial rescue, Natural England Bat Licence Class 2). All trees with potential roost features below 1.5m in height were subject to close inspection, using either a small torch or an endoscope by appropriately qualified and licensed ecologists (Natural England Bat Licence Class 2).

Dusk emergence and dawn re-entry on trees

3.6.11 All trees determined to have moderate to high potential to provide suitable habitat for roosting bats from the results of the climbing survey (or ground assessment where a climbing survey was not feasible) were subject to a minimum of one dusk or dawn survey. The level of survey effort was proportionate to the likely impact of the scheme in accordance with Hundt (2012) and all surveys were conducted with reference to Hundt (2012). For any trees that were to be subject to more than one dusk or dawn survey, and that were suitable for climbing, a second tree climbing survey during the summer months was substituted for one of the dusk or dawn surveys. This approach was agreed with Natural England during a meeting prior to the commencement of surveys.

Woodland backtracking surveys

3.6.12 All woodlands within 100m of the scheme with significant potential to support bat roosts were scoped during the day. Sound recordings were made by surveyors during the surveys.

Activity transects

3.6.13 A total of 20 transects were surveyed along the length of the entire scheme in 2013 and 2014 where safe access permitted. These locations were selected in accordance with best practice guidance contained in Hundt (2012) and were surveyed in line with good practice guidelines (Hundt, 2012) for major infrastructure projects.

Static monitoring surveys

3.6.14 In 2013, static monitoring was carried out at 38 locations along the scheme. In 2014 monitoring at nine additional locations was conducted in accordance with best practice guidance (Hundt, 2012).

Limitations

3.6.15 Some minor limitations occurred due to lack of access, health and safety issues, equipment issues and timing. However, the limitations to the surveys do not represent a significant barrier to adequately assessing the value of bats for the purposes of undertaking a robust ecological impact assessment.

3.6.16 *Table 3.2* summarises the bat surveys carried out between 2007 and 2014.

Table 3.2: Bat survey during the period 2007 to present time

Previous scheme (Ellington to Fen Ditton, 2007-2010)	2013 update	2014 A1 survey (J2A)
Survey: Previous bat surveys (pre-2013) were undertaken and the records used as part of the desk-based surveys. The assessment has been updated based on the 2013 and 2014 updates.	**Survey:** Summer & autumn transect (activity) surveys (x14), static (activity) monitoring (x38) and initial ground assessment of trees and buildings.	**Survey:** Ground assessment of trees and structures (bridges, culverts buildings) within 100m of scheme. Climbing of trees considered suitable to support roosting bats, dusk and dawn activity surveys of trees and structures. Woodland back tracking surveys (of woodland within 100m likely to be impacted). Manual transects and static monitoring for A1 from Alconbury to Brampton and to complete survey effort on the wider scheme where seasonal gaps existed due to access and other limitations.

3.7 Otter and water vole

3.7.1 Full details of the survey methodology for water vole and otter are presented in *Appendix 11.11.*

3.7.2 Both desk-based studies reviewing existing data and field studies were conducted for otters and water vole. Surveys were conducted in 2013 and 2014 in line with published, best practice guidance. Surveys were based on the *Design Manual for Roads and Bridges Volume 10, Section 4, Part 4, HA81/99 – Nature Conservation Advice in Relation to Otters (DMRB HA81/99*) (Highways Agency *et al*., 2001b) for otter surveys and the *Water Vole Conservation Handbook* (Strachan *et al*., 2011). All surveys were carried out by qualified and experienced ecologists.

3.7.3 Where possible both banks of all watercourses bisected by the scheme were surveyed up to 250m in 2013 and up to 500m in 2014, up and downstream to identify the presence/likely absence of otter and water vole. Field signs searched for both species are described below.

Limitations

3.7.4 Due to seasonal constraints and access issues, some watercourses and drains in the area were not surveyed. It is considered that the limitations to the surveys do not represent a significant barrier to adequately assessing the value of riparian mammals for the purposes of conducting a reasonable ecological impact assessment. However, any potential data gaps should engender caution when assessing impacts.

3.8 Freshwater fish

3.8.1 Full details of the survey methodology for freshwater fish are presented in *Appendix 11.3 of the ES*.

3.8.2 Freshwater fish data were requested from the Environment Agency for all watercourses within the study area and a 250m buffer zone on watercourses crossed by the scheme. Where limited data were identified within the 250m buffer zone, further data from a wider buffer zone were requested for those waterbodies crossed by the scheme or with the potential to receive road discharge.

3.8.3 A database of incidental records of species of interest recorded by other surveyors on the scheme was reviewed for records of relevance to this report.

3.8.4 Seven sites were identified from the whole scheme for freshwater fisheries survey following site walkovers on 2 – 4 December 2013 and 4 – 5 March 2014. Surveys were undertaken using *Water Framework Directive* (*WFD*) compliant electric fishing between 25 and 29 July 2014.

3.8.5 Freshwater fish were surveyed by carrying out three electric fishing runs over a 100m indicative reach on each watercourse crossed by the scheme or potentially affected by road surface water discharge. The catch depletion between each individual run allows an estimate of the population to be made.

3.8.6 Physiochemical water quality data was also collected by means of a calibrated YSI probe. Water quality metrics include temperature (^{o}C), dissolved oxygen (% and mg/L), conductivity (mS/L), salinity (no units) and pH.

3.8.7 These data were used to support community level analysis of the freshwater fish data.

Limitations

3.8.8 Access was not gained for sites on the West Brook and its tributaries. Assessment of the potential impact on this watercourse was therefore based upon the professional judgement of suitably qualified and experienced specialists.

3.8.9 At the time of survey the Swavesey Drain was heavily vegetated, reducing sampling efficiency. As a result, the Swavesey Drain could not be surveyed using a fully quantitative method.

3.8.10 An absence of a species record within an area does not necessarily reflect an absence of that species. Similarly, the distribution of species records may reflect survey effort rather than an accurate distribution of that species. As such, all records should be assessed with caution.

3.9 Controlled species

3.9.1 The presence of invasive species, as previously described, was noted during the phase 1 habitat survey of the scheme and during incidental observations during great crested newt surveys. A phase 1 habitat survey of all accessible land within the footprint of the scheme and a 250m buffer was conducted on foot by experienced ecologists at an appropriate season of the year for Phase 1 survey. During the survey target notes (TN) were recorded along with photos of any species or subject of particular note including protected and invasive species and were sequentially numbered and assigned a grid reference. This approach is appropriate and a standard procedure for this taxa.

4 Presence of protected and controlled species

4.1 Introduction

4.1.1 This section provides a summary of the presence of protected and controlled species which have legislative compliance implications at all stages of the scheme. Further details are provided in *Chapter 11 of the ES* and the relevant protected species technical appendices.

4.2 Great crested newt

4.2.1 Field surveys in 2013-14 recorded great crested newt in 32 waterbodies with potential associated terrestrial habitat within the survey corridor, that is, in waterbodies within 500m of the off-line scheme footprint and within 250m of the on-line scheme footprint.

4.2.2 No great crested newt waterbodies occur within the footprint of the scheme, but some are located within the surrounding area.

4.2.3 The maximum count from the 2013-2014 surveys for great crested newt was recorded in each waterbody and the population size class assessment was provided in accordance with English Nature (2001). Populations were all in the 'small' to 'medium' size classes within the survey area.

4.2.4 A local population of great crested newt may treat a number of geographically close waterbodies as a single breeding locality, which then is said to support a metapopulation. Metapopulations are identified as those occupying confirmed great crested newt breeding waterbodies that lie within 500m of each other. *Table 4.1* summarises the key areas recorded for great crested newt during the surveys and lists the clusters of waterbodies in which great crested newt are likely to exist within the same metapopulation (illustrated in *Figure 11.4* of the *ES*).

Table 4.1: Clusters of waterbodies in the same general location likely to support the same metapopulations

Location	Pond numbers in metapopulation	Size range of populations within each individual waterbody
West of Brampton Hut	49	Small
Hinchingbrooke	52, 52a, 52b, N1, N1b	Small – Medium
Outskirts of Godmanchester	31, 31b, 32, 34, N28, N32	Small
Fenstanton	21, 22, 23	Small – Medium
Conington	N39a, N39b, N39c, N40, N41, N41a, N42, N43, N43a	Small – Medium
City of Cambridge crematorium	14a, 14b, 14c, 14d, 14e, 14f	Small – Medium

Population size classes: Small=1-10 peak count, medium=11-100, large> 100.

Great crested newt mitigation guidelines (English Nature, 2001).

4.3 Reptiles

4.3.1 Four records of viviparous lizard and eight records of grass snake were provided by the data search. No incidental records of reptiles were recorded during other surveys for the scheme.

4.3.2 During surveys in 2013 and 2014, grass snake and viviparous lizard were recorded.

4.3.3 In 2013, grass snake were recorded on two occasions in proximity to Buckden Marina and viviparous lizard were recorded beneath six different artificial cover objects (ACOs) over five of the survey visits at R15 – National Institute of Agricultural Biology (NIAB). The maximum count for viviparous lizard was five.

4.3.4 In 2014, only grass snake was recorded in the seven survey visits, in North, Middle and South Nursery Farm. The maximum count was two. Both adult and juvenile were recorded.

4.4 Birds

4.4.1 A wide range of breeding bird species (85) were recorded in all habitats and throughout the survey corridor. Wintering bird species were also found throughout the survey corridor.

4.4.2 Thirteen *Schedule 1 Part I Wildlife and Countryside Act 1981 (as amended)* bird species were recorded in the survey corridor. Four of these species (hobby (*Falco subbuteo*), barn owl, kingfisher and Cetti's warbler (*Cettia cetti*)) were recorded during the breeding season and are likely to have bred either within the construction corridor or in the close vicinity.

4.4.3 A number of (highly mobile) wildfowl species, particularly gadwall (*Anas strepera)* occur in the survey corridor that are also qualifying species of the Ouse Washes SPA, which is located 9.3km north-east of the scheme.

4.5 Badger

4.5.1 The desk study revealed 38 historical records within 100m of the scheme.

4.5.2 The combined results of all surveys are presented in *Figure 11.10 in Volume 2 of the ES* (categorised according to sett type) and are summarised for the purpose of this report.

4.5.3 Badger activity along the scheme was found to be widely distributed, with 6 main setts recorded within the development consent order area including an additional thirty metre disturbance buffer. In addition one annex sett, three subsidiary setts, 14 outlier setts and 11 setts of undetermined status were also identified the development consent order and thirty metre buffer.

4.5.4 Fifteen setts require closure on the scheme. one main sett (i1), five setts of undetermined status (A12, A21, A7, Ai1, i5), one subsidiary (BP3.1) and eight outliers (1.1, 2.2, 6.8, 7b, A30, BP2.1, BP2.2, BP2.4). A further 20 setts require disturbance free buffer areas marked out comprising of six main setts, six setts of undetermined status, one annexe, two subsidiaries and six outliers.

4.6 Bats

4.6.1 The Cambridgeshire and Peterborough Environmental Records Centre (CPERC) returned 167 records of bats in the data search. The Cambridgeshire Bat Group returned 481 records for the main scheme and 64 records for the A1 widening.

4.6.2 Surveys to inform the *ES* for the A14 Ellington to Fen Ditton scheme (Atkins, 2009) identified two bat tree roosts and one possible roost. Dusk emergence surveys on 28 May 2008 identified a single common pipistrelle emerging from a crack willow tree adjacent to the river Great Ouse (see *Figure 11.10 of the ES* for roost location). Dusk surveys on 17 September 2008 identified two common pipistrelle bats emerging from the canopy of the most southerly of two mature oak trees within a hedge line east of Madingley Road (see *Figure 11.10 of the ES* for roost locations). Surveys of the woodland belt north of Huntingdon police station concluded likely roosts in trees in this area.

4.6.3 There are records of 36 roosts within 1km of the site (including the two identified by Atkins in 2008).

4.6.4 Bats were recorded commuting and foraging during the activity surveys which took place around the scheme.

4.6.5 A total of 19 tree bat roosts and eight building roosts were confirmed in 2013/2014 surveys. Of the 27 roosts identified from recent field surveys and the two roosts identified by Atkins in 2008, four roosts are directly under the footprint of the scheme, and a further five are located on the periphery of the construction footprint and so may be directly impacted. A building roost, B.31, is also located on the periphery of the construction footprint, but it is assumed it will be retained.

4.6.6 The species recorded included unspecified species of the pipistrelle genus (*Pipistrellus* sp.), common pipistrelle (*Pipistrellus pipistrellus)*, soprano pipistrelle (*Pipistrellus pygmaeus),* brown long eared bat (*Plecotus auritus)*, unspecified bats of the mouse-eared bat genus *Myotis* sp., and Natterer's (*Myotis nattereri)*. Barbastelle (*Barbastella barbastellus)* was also recorded during activity surveys but no roosts were recorded within or immediately adjacent to the scheme.

4.6.7 From a total of 45 static monitoring points, 12 species of bat were recorded.

4.7 Water vole

4.7.1 The Cambridgeshire and Peterborough Records Centre data search returned a total of 58 records for water vole. There are particular concentrations of these historic records for water vole north-east of Cambridge, near the town of Milton.

4.7.2 There were no positive signs of water voles identified within the 2013 survey sites, although at one site, west of Girton, a potential water vole latrine was observed. However the droppings were in poor condition but as a precautionary measure are being treated as a positive record. In 2014, of 29 surveyed waterbodies, two sites on the Alconbury Brook provided positive evidence of the presence of water vole through identification of latrines, burrows, footprints, pathways, feeding remains or by hearing voles enter the water during surveys.

4.8 Otter

4.8.1 The biological records centre data search returned 22 records for otters in the search area. The records are concentrated around the river Cam, river Great Ouse, Ellington Brook and Alconbury Brook and their catchment areas.

4.8.2 *The Environment Agency's Fifth Otter Survey of England 2009 - 2010* (Crawford, 2011) and the *Cambridgeshire and Peterborough Otter Survey 2012* (Hawksley, 2012) both show that the otters' range in the relevant locality has gone through a major expansion.

4.8.3 Incidental records arising from surveys relating to the scheme are of otter spraints found under bridges that straddle Ellington Brook, north of the A14 and Alconbury Brook, close to Huntingdon Racecourse.

4.8.4 Surveys carried out by the Highways Agency in 2013 and 2014 identified a low density of otters throughout the area of the scheme, with particular concentrations of field signs located within major waterways, such as the river Great Ouse, Alconbury Brook, Brampton Brook, Cock Brook and West Brook.

4.8.5 Dedicated otter surveys in 2013 recorded spraints within a waterway linked to West Brook, near Fenstanton, and a second site at Fen Drayton.

4.8.6 In 2014 seven sites were positively identified for the presence of otters through identification of spraints or footprints or a combination of both. These sites included the major tributaries within the area of the scheme such as Alconbury Brook, Cock Brook and Ellington Brook.

4.9 Freshwater fish

4.9.1 Freshwater fish were recorded from all of the sites surveyed, the species observed being typical of lowland freshwater environments.

4.9.2 Three of the watercourses crossed by the scheme have been classified for freshwater fish under the *WFD.* The river Great Ouse and Swavesey Drain are classified as good quality for fish, indicating that the composition, abundance and age structure of fish communities show a slight deviation from reference condition, i.e. sites unaffected by human intervention, but are otherwise in a good condition.

4.9.3 793 individuals, representing 12 species, were recorded from the five sites surveyed. Three-spined stickleback was reported from four sites whilst nine species were recorded from a single site.

4.9.4 European eel and spined loach were only observed on the Swavesey Drain, whilst bullhead were restricted to the Alconbury Brook. Both European eel and spined loach have a wider distribution than suggested in the 2014 study data with the former previously having been recorded in Environment Agency monitoring on the Alconbury Brook.

4.9.5 Bullhead have not previously been recorded from watercourses within the survey area but the Environment Agency have recorded this species from catchments outside the survey area.

4.9.6 Spined loach has been recorded from the Ellington Brook and Swavesey Drain. Neither of these watercourses are designated as one of five UK Special Areas of Conservation (SAC) for spined loach. The nearest SAC for which spined loach are a primary qualifying feature is the Ouse Washes (particularly Counter Drain), which lies to the north east of Huntingdon.

4.10 Controlled species

4.10.1 Four invasive species listed on *Schedule 9 of the Wildlife and Countryside Act 1891 (as amended)* were recorded in the study area. These species are New Zealand pigmyweed, Japanese knotweed, Canadian pondweed and signal crayfish.

4.10.2 New Zealand pigmyweed was found in three waterbodies. Japanese knotweed was recorded at two locations. There were various records of Canadian pondweed and signal crayfish in ponds within the survey area.

5 Potential to cause offences

5.1 Introduction

5.1.1 This section provides an overview of the potential legal breaches that could occur in relation to protected and controlled species through pre-construction, construction and operational activities associated with the scheme. Details of the licensing requirements and mitigation measures that would be carried out to ensure legal compliance are provided in following sections of this report.

5.2 Great crested newt

5.2.1 Construction works in the vicinity of waterbodies and associated terrestrial habitat that are used by great crested newt as breeding sites have the potential to cause an offence under the *Conservation of Habitats and Species Regulations 2010 (as amended)*, the *Environmental Damage (Prevention and Remediation) Regulations 2009 (as amended)* and the *Wildlife and Countryside Act 1981 (as amended)*. Great crested newt is a terrestrial species over the greater part of its annual cycle, and construction activities at a distance from breeding waterbodies therefore have the potential to affect the species and thereby cause an offence under the legislation.

5.2.2 Potential offences are not limited to those involving direct physical contact with great crested newt. Any activity that adversely affects breeding sites or resting places, for example through pollution or silting of breeding waterbodies, is likely to be an offence under the legislation.

5.2.3 Potential to cause offences at breeding waterbodies may therefore arise from:

- infilling of breeding waterbodies;
- fragmentation of metapopulations by isolating individual waterbodies;
- modification of breeding waterbodies and their vegetation through discharge of pollutants, nutrients and/or silt;
- short-term disturbance during critical parts of the annual cycle; and
- improved human access to breeding waterbodies, encouraging post-construction disturbance.

5.2.4 Potential to cause offences in great crested newt terrestrial habitat may arise from:

- direct mortality through trampling, trafficking and works operations in habitats used by great crested newt for resting foraging and hibernation;
- destruction of resting places and hibernation sites;
- fragmentation of terrestrial habitats, preventing access to resting places and hibernation sites;

- changes to land management, resulting in sub-optimal terrestrial habitat;
- short-term disturbance during critical parts of the annual cycle;
- improved human access to breeding waterbodies, encouraging post-construction disturbance; and
- temporary destruction followed by reinstatement.

5.2.5 No known great crested newt breeding waterbodies would be destroyed as a result of the scheme. However, three waterbodies would be within 250m of the new carriageway, two waterbodies within 250m of borrow pits, 18 within 250m of the scheme construction area buffer zone and five within 250m of soil storage areas.

5.2.6 The potential to cause an offence can be eliminated through knowledge of the distribution of local breeding waterbodies and the extent of great crested newt metapopulations, recognition of the potential impacts of proposed works on these, and, where adverse impacts have been identified, carrying out mitigation procedures to prevent adverse impacts at both the individual animal and the population level.

5.3 Reptiles

5.3.1 The killing and injury of common reptile species could cause offence under the *Wildlife and Countryside Act 1981 (as amended)*.

5.3.2 Grass snake were recorded in proximity to Buckden Marina; North, Middle and South Nursery Farm. Viviparous lizard were recorded at six locations over five surveys.

5.3.3 Vegetation clearance has the potential for killing and injury of reptiles and thereby causes an offence under the *Wildlife and Countryside Act 1981 (as amended)*. The potential offence can occur at any time of year, but can be a particular issue in the winter months when reptiles may be hibernating. The winter months can be a common time to undertake vegetation clearance, as that season avoids other constraints such as the bird breeding season.

5.4 Birds

5.4.1 There is a potential to cause an offence under the *Wildlife and Countryside Act 1981 (as amended)* if works disturb a protected bird species while it is building or using a nest. This provision applies to all birds that are likely to be found to be nesting in any habitats that would be disturbed by the scheme.

5.4.2 It is unlikely that bird species, which are qualifying features for the Ouse Washes SPA (9.3km to the north of the scheme), e.g. gadwall, and occurring during winter and the breeding season in the study area, would be adversely affected by the scheme. *Appendix 11.12 of the ES* confirms that impacts on the Ouse Washes SPA were screened out due to the distance. There is thus negligible potential to cause an offence under the *Conservation of Habitats and Species Regulations 2010 (as amended) (*for details see *Appendix 11.6.*

5.4.3 Barn owl and kingfisher are specially protected as a *Schedule 1* species under the *Wildlife and Countryside Act 1981 (as amended)*. In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, *Schedule 1* birds and their young must not be disturbed at the nest, except under licence for specified purposes. The legislation does not permit licences to be issued in relation to development of land.

5.4.4 Eleven confirmed barn owl nest sites, comprising six nest boxes (three barn boxes, two tree boxes and one pole box), four tree cavities and one hay bale, were identified within the survey area. One nest site which was confirmed as active in 2013 is situated within the proposed construction footprint of the scheme.

5.5 Badger

5.5.1 Badger are protected under both the *the Protection of Badgers Act 1992* and the *Wildlife and Countryside Act 1981 (as amended*).

5.5.2 Badger surveys have indicated that the species is present along much of the scheme, with setts at a large number of locations.

5.5.3 Sett interference includes damaging or destroying a sett, obstructing access to a sett, and disturbing a badger whilst it is occupying a sett.

5.5.4 However, guidance has been issued in *Interpretation of 'Disturbance' in relation to badgers occupying a sett.* (Natural England, 2009b) to identify actions which are likely to have little or no effect on any badgers present.

5.5.5 Persons involved in activities near setts would need to exercise judgment as to whether their action may or may not cause disturbance to badgers.

5.5.6 Some examples of activities at or near setts that are not considered likely to cause disturbance to badgers, and therefore would not normally expect to require a licence, include:

- development, or other activities occurring close to badger setts (use of hand tools and/or machinery), where there is no reason to believe that the 'disturbance' would be greater than that which badgers commonly tolerate, and therefore any badger(s) occupying the sett are unlikely to be disturbed;
- vegetation removal (including felling small trees or shrubs) over or adjacent to setts (using hand tools and/or machinery); and
- clearing out of ditches/watercourses using machinery and/or hand tools where badger setts are present.

5.5.7 An active sett according to Natural England (2009a) is protected by the legislation if it "*displays signs indicating current use by a badger*". A sett is therefore protected as long as such signs remain present. In practice, this could potentially be for a period of several weeks after the last actual occupation of the sett by a badger or badgers. If setts are present it should be assumed that they are active unless a survey shows that there are no signs of badger activity in the area.

5.5.8 At the detailed design stage judgment would be required as to which of these setts would be impacted by the scheme and associated works and where a potential offence is possible.

5.5.9 Operations that involve loud noise and/or vibration have the potential to cause disturbance at greater distances, and a radius of 100m from an active sett is generally accepted as the distance at which these operations have the potential to have adverse effects on badgers.

5.5.10 Construction works may present additional hazards to badgers, with a potential for entrapment within excavations, accidental injuries on construction plant or materials, diversion from traditional trails by plant and site compounds and exposure to oils and other toxic materials. There is therefore a potential to commit an offence by causing injury or death as a result of the works.

5.6 Bats

5.6.1 Construction works which directly impact structures or trees which have been identified as bat roosts have potential to cause offence under the *Conservation of Habitats and Species Regulations 2010 (as amended)*.

5.6.2 Potential offences are not limited to those involving direct physical contact with bats or bat roosts. Construction may involve activities which cause disturbance to roosting bats, this includes:

- removal of hedgerows which have been identified as flight lines to roosts;
- redirection of waterways which have been identified as flight lines to roosts; and,
- removal of areas which have been identified as used for foraging around roost sites.

5.6.3 A minimum of four and a maximum of nine bat roosts would be destroyed as a result of the scheme. A further 20 bat roosts were confirmed within the road scheme boundary. There is therefore a potential for offences to occur as a result of works in proximity to bat roosts.

5.7 Water vole

5.7.1 The water vole is fully protected under *Schedule 5* of the *Wildlife and Countryside Act 1981 (as amended)*, and there is a potential to cause an offence under the Act if a water vole is harmed, captured or disturbed at its burrow, or its burrow or shelter is damaged or access prevented.

5.7.2 Potential to cause offences with regard to water vole may arise from:

- accidental mortality arising from works practices;
- damage to burrows, or access to burrows; and
- disturbance that prevents use of their burrows by water vole.

5.7.3 Water vole activity along the scheme corridor was concentrated along the Alconbury Brook, in proximity to the scheme.

5.7.4 There is a potential to directly disturb water vole through the proximity of works to their burrows, which may prevent the use of burrows during the period of disturbance.

5.7.5 There is potential for killing and injury during works.

5.7.6 There are a large number of historic water vole records along watercourses in the vicinity of the scheme. The potential to cause an offence applies to water vole burrows that are in use. Unoccupied historic sites are not a risk in terms of compliance with the legislation.

5.7.7 As water vole are mobile, further surveys would be required prior to construction to ensure the exact status and location of the burrows are known and potential offences avoided.

5.8 Otters

5.8.1 European otters are a mobile species, and it is therefore relevant to describe the general distribution of the species, since animals may occur sporadically as transients or as prospecting individuals, at distance from a breeding area. In this context, it should be noted that an absence of a survey record within an area does not necessarily reflect a local absence of that species. Similarly the distribution of species records may reflect survey effort rather than an accurate distribution of that species. As such, historic records should be assessed with caution.

5.8.2 Construction works in the vicinity of waterbodies that are used by otters as places of rest, shelter, or breeding sites have the potential to cause an offence under the *Conservation of Habitats and Species Regulations 2010 (as amended)*, the *Environmental Damage (Prevention and Remediation) Regulations 2009 (as amended)* and the *Wildlife and Countryside Act 1981 (as amended)*.

5.8.3 Potential to cause offences with regard to otter may arise from:

- accidental mortality arising from works practices;
- damage to resting places or holts;
- damage to riverine habitats, so as to affect significantly the local distribution or abundance of the species;
- fragmentation of habitats, so as to affect significantly the local distribution or abundance of the species; and
- increased mortality, so as to affect significantly the local distribution or abundance of the species.

5.8.4 Although no otter holts or couches were identified during the 2013/2014 surveys, there were signs that otters use the rivers in proximity to the scheme route. The desk-based study indicated that otters are expanding in the major waterways in this part of Cambridgeshire and historic records show dispersal along many of the watercourses in the vicinity of the route. Whilst the survey indicated likely absence from the construction zone and associated areas, the potential for otters to adopt home ranges within disturbance distance of the scheme post-survey must be borne in mind in order to avoid an offence being committed.

5.9 Freshwater fish

5.9.1 The *Salmon and Freshwater Fisheries Act (SAFFA) 1975* provides protection to freshwater fish, with a particularly strong focus on salmon and trout. There are many activities that could constitute an offence under *SAFFA* including direct mortality, barriers to migration, release of polluting effluent and degradation/damage to habitats.

5.9.2 Barriers to fish passage, such as the installation of weirs and extension of culverts, can be key issues. Any new or extended culverts and other structures would need to be designed to facilitate the passage of key fish species and life stages. Appropriately designed channel re-alignments and other best practice solutions would need to be considered during mitigation design.

5.9.3 Under the *Eels Regulations 2009* the scheme would need to take into account the current and future passage of eels between the freshwater and the marine environment and this would apply to both the construction and operational stages of the scheme.

5.10 Controlled species

5.10.1 It is not an offence to simply have *Schedule 9* species growing on a development site. There is no specific legal requirement to control these species if present (unless doing so forms part of a legally binding contract or agreement with another party).

5.10.2 The potential to cause offence in relation to the scheme relates to causing invasive species to spread. Negligent or reckless behaviour and the inappropriate disposal of waste soil or vegetation containing fragments of rhizomes or cut stems where this results in a *Schedule 9* species becoming established in the wild would constitute an offence.

5.10.3 On the scheme there are two aquatic invasive plant species (New Zealand pigmyweed and Canadian pondweed), one terrestrial plant species (Japanese knotweed) and the invasive invertebrate signal crayfish.

5.10.4 The potential to cause offence would derive from inappropriate working practices where an invasive species is present. The potential for transporting species or fragments of material to a new location is high if one of the invasive species is present in an area and appropriate actions are not implemented for the prevention of spread.

5.10.5 Special note must be made in relation to managing other protected species, especially aquatic mammals and great crested newts, where actions to manage these protected species may be impacted by the presence of *Schedule 9* species.

6 Licensing requirements

6.1 Introduction

6.1.1 Based on the requirements of legislation as outlined in *Section 2*, the baseline presence of protected species (*Section 4*) and the potential to cause offence (*Section 5*), the overall requirement for a licence to conduct the works are presented in this section on a species by species basis. Further detail on the requirements of mitigation in order to successfully obtain a licence is then presented in *Section 7* for each relevant species.

6.1.2 This section provides details on all licensing and legislative requirements for protected and controlled species that would be applied for and resolved by the scheme for the construction and operation phases. This section also addresses the requirements for species licensing, in scenarios not currently confirmed but could be a consideration if additional evidence of their presence is confirmed during pre-construction walkovers.

6.2 European protected species licensing

6.2.1 Bats, otters and great crested newts are European protected species and are protected under the *Conservation of Habitats and Species Regulations 2010 (as amended)*. If a breach in legislation is anticipated, a European protected species licence would be required.

6.2.2 It must be shown that the licence derogating from the protection afforded to European protected species by the Regulations fulfils the "three tests" required by *Part 5* of the *Conservation of Habitats and Species Regulations*:

- the activity to be licensed is required for preserving public health or public safety or other "imperative reasons of overriding public interest" including those of a social or economic nature and beneficial consequences of primary importance for the environment;
- there must be no satisfactory alternative; and
- favourable conservation status of the species must be maintained.

6.2.3 The element of the first "test" that is applicable to the scheme is imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment. The road is a Nationally Significant Infrastructure Project (NSIP) and therefore has considered alternatives through the statutory process (refer to *Chapter 4*). The mitigation proposals would ensure that the favourable conservation status of species is maintained.

6.2.4 For NSIPs involving significant impacts on a European protected species, a mitigation licence would be required. During detailed design a full draft licence application would be submitted, including;

- licence application form;
- method statement;

- maps;
- proposed SMART timetable; and
- Reasoned Statement.

6.2.5 Mitigation licences are issued by Natural England in the name of the applicant (who is thereafter referred to as the licensee). It would also name the ecological consultant working on behalf of the licensee. All mitigation licences would name the relevant species, the permitted actions and where appropriate the maximum numbers to be affected. Licences can only be determined once a legal scheme has been agreed through the planning process.

6.2.6 A licence would also contain a standard set of conditions, including a condition explaining that anyone authorised to carry out activities under the licence who fails to comply with the conditions would be committing an offence (i.e. under regulation 58 "*it is an offence for a person to contravene or fail to comply with a licence condition*").

6.2.7 A condition of licences is that post development monitoring data must be sent to the Local Records Centre within a certain time period. In most cases the licence would comprise a three page document and the Delivery section of the Method Statement (including maps where applicable).

6.2.8 Once a licensed period has expired it is not possible to re-issue the licence. It is the responsibility of the licensee to ensure that the activity is completed within the timescales set out in the timetable or, if necessary, to seek a licence extension in advance of the expiry date. If the licensed period has expired and licensable activities are still required then a new application pack would be required, but the case history should be clearly explained and action taken under the previous licence detailed.

6.2.9 Natural England aim to provide a licence or refusal (including an explanation) within 30 working days of application.

6.3 Great crested newt

6.3.1 A summary of broad licensing requirements in relation to European protected species are presented in *Section 6.2* of this report.

6.3.2 It is anticipated that there would be a likelihood of disturbance of great crested newt individuals and populations arising from the construction and operation of the scheme. Measures that are likely to be required include translocation of great crested newt from terrestrial habitat that would be adversely affected by the scheme to suitable sites elsewhere in the vicinity. Translocation is a licensable activity as defined in the *Conservation of Habitats and Species Regulations 2010 (as amended)*.

6.3.3 In addition, at the pre-construction stage, a licence holder would be required to undertake further great crested newt surveys.

6.4 Reptiles

6.4.1 There is no licensing process for the disturbance of reptile habitat or translocation of common species of reptiles. However, best practice dictates that a detailed methodology is produced to demonstrate compliance with the relevant legislation, i.e. to prevent killing and injury. As a licence is not required reptiles are not considered further here but their mitigation is appraised in detail in *Section 7* in relation to best practice mitigation and approach.

6.5 Birds

6.5.1 There is no provision under the *Wildlife and Countryside Act 1981 (as amended)* for licences to be granted to carry out actions that would otherwise be an offence under the Act.

6.5.2 At the pre-construction stage, a licence is required to survey known barn owl nest sites.

6.6 Badger

6.6.1 Where works are likely to cause disturbance to a badger sett, then a licence from Natural England would be required. It is not illegal (and therefore a licence is not required) to carry out disturbing activities in the vicinity of a sett if no badger is disturbed and the sett is not damaged or obstructed.

6.6.2 The scheme would necessitate the closure of a number of setts, either as a temporary or a permanent measure. Natural England would require information on the use that badgers make of a particular sett before granting a licence to interfere with the sett. Detailed information would be required in order to establish the function of a sett; the effects of disturbance of main setts would require greater consideration than outlier setts, for example.

6.6.3 Natural England would expect a developer to follow best practice to ensure that disturbance of animals is kept to a minimum:

- foraging areas should be maintained or new foraging areas should be created;
- access between setts and foraging/watering areas should be maintained or new ones provided;
- natural setts are usually favoured over artificial setts, so unnecessary closure of natural setts should be avoided;
- excavation work and heavy machinery should be kept well away from where it could result in damage to the sett or disturbance to any badger occupying the sett;
- fires and chemicals should not be used within 20m of a sett;

- trees should be felled so that they fall away from active setts and badger paths should be cleared of felled timber and scrub wherever possible; and
- disturbances, such as loud noise or vibrations, that might agitate badgers occupying a sett should be avoided or limited to areas well away from the sett.

6.6.4 It is likely that a licence to interfere with a sett would contain a number of conditions, such as:

- sett interference should be avoided between the beginning of December and the end of June, which is when badgers are breeding. Badgers are particularly vulnerable at this time of year and sett interference can result in dependant cubs being left on their own.
- the law does not permit licences to capture badgers for development purposes, so physically moving them out of the way of development is not an option;
- the person to be licensed should be competent and would, ideally, have previous, relevant experience in carrying out this type of work;
- excluding badgers from a sett under licence takes time. Typically a licence would require that exclusion methods, such as one-way badger gates, are in place for a minimum period of 21 days following the last sign indicating possible access by badgers to the sett; and
- licences take 30 working days to determine applications.

6.6.5 The principal actions that would require a licence for the scheme are temporary or permanent closure of setts. To comply with the licence the provision of an artificial sett, where main setts are impacted would be required in addition to standard compliance mitigation in relation to habitat manipulation etc.

6.7 Bats

6.7.1 A summary of broad licensing requirements in relation to European protected species is presented in *Section 6.2* of this report.

6.7.2 Licences can be granted by Natural England (the licensing authority) to allow activities that would otherwise be illegal to be conducted, including allowing development to take place, if carried out in accordance with the provisions of the licence.

6.7.3 It is anticipated that there would be a likelihood of disturbance of bats arising from the construction and operation of the scheme. Measures that are likely to be required include destruction of bat roosts and ‘like for like’ mitigation required within the vicinity of the scheme. Roost destruction is a licensable activity as defined in the *Conservation of Habitats and Species Regulations 2010 (as amended)*.

6.7.4 With regards to bat licence applications, in addition to meeting the three tests, the applicant must also provide the following information:

- a summary of the proposals (scale and nature of the proposed activity);
- details of the species, number and roost type;
- details of the consents required, if they have been given yet and the contact details of the consenting authority; and
- statements and evidence of how the three tests have been met under prescribed headings. The method statement must include information about the surveys carried out to date, the visual inspection results, an evaluation of results, new roost creation detail, other habitat re-instatement or creation, wider biodiversity gains and post development site safeguards.

6.7.5 Finally a timetable of works for before, during and post-construction is required.

6.7.6 At the pre-construction stage, a suitably licensed ecologist is required to enter known bat roosts.

6.8 Water vole

6.8.1 Water voles are now fully protected under the *Wildlife and Countryside Act 1981 (as amended)* and this protection has implications for developers and planners who wish to carry out work where water voles are present.

6.8.2 Licences are issued to permit acts that would otherwise be illegal. They must be issued under the purpose for which the proposed activity is being carried out. There are only a limited number of purposes for which licences may be issued in the UK and these do not include activities related to development.

6.8.3 If offence issues are likely then the proposed work should be amended to ensure that the work would not result in an offence. If it is not possible to remove the offences entirely then the proposed works should be amended to, where possible, reduce or remedy the adverse effects on water voles. Such actions should be documented in a method statement.

6.8.4 If after such remedies are incorporated, offence issues still cannot be reasonably avoided then the developer would need to rely on the incidental result defence. This defence under *section 10(3)(c) of the Wildlife and Countryside Act* allows the carrying out of lawful operations from which some harm to the species would arise in terms of the listed offences as an incidental result of actions that could not reasonably have been avoided.

6.8.5 Such a defence is only sustained if, as far as is reasonable, appropriate action is taken to safeguard the animals and their places used for shelter and protection. Ultimately only a court can decide what is reasonable and to what extent adverse impacts might have been reasonably avoided.

6.8.6 In some circumstances there may be genuine grounds for issuing a licence for the purpose of conservation. Such circumstances would be those in which, despite all efforts to minimise the impacts, significant risk of killing or injuring water vole cannot be reasonably avoided. Licence applications to interfere with water vole burrows, water voles in their burrows or trapping water voles for translocation reasons may be considered by Natural England when a net conservation benefit to the population can be demonstrated.

6.8.7 To translocate water vole for conservation purposes the applicant would have to provide Natural England with the following documents:

- completed licence application form WML A29; and
- methodology of the proposed works.

6.8.8 As wildlife can be extremely mobile and absence of a species can never be totally confirmed, it is advised that removal of vegetation should be conducted with caution. In the event that water vole or associated signs are discovered on site once works have commenced, works in that area should stop immediately and advice be sought from an experienced ecologist or Natural England.

6.8.9 In the scheme, pre-construction surveys would be carried out and the results of these would inform the requirement for water vole translocation.

6.9 Otter

6.9.1 A summary of broad licensing requirements in relation to European protected species are presented in *Section 6.2* of this report.

6.9.2 Licences can be granted by Natural England (the licensing authority) to allow otherwise illegal activities, including development, to take place if carried out in accordance with the provisions of the licence.

6.9.3 In the current absence of otter holts or resting places within the disturbance zone of the scheme and associated works licensed activities with regard to otter would not be required. However, if otters occupy a holt prior to the beginning of works, and it is likely that the animals would be disturbed by the works, a licence may be required.

6.10 Freshwater fish

6.10.1 There are no specific licensing requirements in relation to fish for the construction and operational stages of the project.

6.10.2 The *Eels (England and Wales) Regulations 2009* implement *Council Regulation (EC) No 1100/2007* (European Commission, 2007) establishing measures for the recovery of the stock of European eels.

6.10.3 Actions likely to impact on the recovery of the eels in UK waters may be in contravention of the Regulations and include:

- abstracting and/or discharging water for a wide range of industrial, agricultural and other purposes;
- impounding works: any dam, weir, or other works by which water may be impounded; and
- constructing, altering or maintaining a dam, or any other structure in or near water, liable to cause an obstruction to the passage of eels.

6.10.4 The requirements of the Regulations in relation to this scheme are to notify the Environment Agency:

- of the construction, alteration or maintenance of any structure likely to affect the passage of eels;
- where any such structure exists, the requirement to construct and operate an eel pass to allow the free passage of eels;
- the removal of any obstruction, if deemed necessary; and
- the use of eel screens to exclude eels from water abstraction and discharge points.

6.11 Controlled species

6.11.1 No licences for controlled species are required for the scheme.

6.11.2 Japanese knotweed is a controlled species and removal, if required, would need to be carried by a licensed waste carrier to a facility licensed to accept controlled waste. The management of *Schedule 9* species and in particular Japanese knotweed can have further legislative implications for those responsible for the scheme development and associated with the control of Japanese knotweed.

6.11.3 If certain chemicals have been used to prevent the spread of Japanese knotweed, the waste may be considered hazardous.

6.11.4 On 1 June 2005, the Environment Agency introduced a package of crayfish Byelaws that would allow them, under certain conditions, to approve the trapping of crayfish in England and Wales. The removal of signal crayfish from a waterbody in the course of mitigation works, normally undertaken by trapping, would therefore require consent from the Environment Agency.

7 Compliance mitigation

7.1 Overview

7.1.1 This section outlines the mitigation measures that would be carried out to achieve compliance with relevant legislation for protected and controlled species.

7.1.2 In general terms, mitigation has been designed-in to minimise the impact of the scheme on ecology and has sought to avoid impacts in the first instance. This for example would be achieved through the careful siting of infrastructure away from sensitive habitats and timing of works to avoid sensitive periods. The mitigation strategy also includes:

- ensuring no net loss of valued habitats;
- maintaining the north-south wildlife dispersal corridors across scheme as far as possible, using culverts and structural planting (in conjunction with fencing and sensitive lighting);
- maximising the east-west habitat connectivity along the scheme with new landscaping using native and locally appropriate species;
- minimising culverting of watercourses; and
- creation of new habitats along the highways estate in order to achieve net habitat and biodiversity gain along the scheme.

7.1.3 It should be noted that this section presents those mitigation measures which focus on compliance issues. It should be read in conjunction with *Chapter 11 of the ES*, *Appendix 20.1 and Appendix 20.2*.

7.1.4 The Code of Construction Practice (*Appendix 20.2*) sets out a series of proposed measures and standards of work that would be applied by the Highways Agency and its main contractors' throughout the construction period. At a local level, site specific control measures would be included within local environmental management plans, which would be developed following consultation with the relevant stakeholders. In addition, the Highways Agency would require its main contractors to have an Environmental Management System certified to BS EN ISO14001.

7.2 Great crested newt

7.2.1 No waterbodies known to support great crested newts would be lost due to the scheme, but the close proximity of such waterbodies to soil storage areas, borrow pits and the constructed new road indicates that there would be a significant loss of terrestrial habitat in the vicinity of some waterbodies.

7.2.2 A single group of waterbodies identified as likely to support a metapopulation of great crested newts would be severed as a result of the proposed scheme. In this location a great crested newt receptor area would be provided which includes new great crested newt terrestrial habitat and waterbodies on both side of the road. The receptor site is located within 250m of these waterbodies on both the north and south sides of the new road and is complemented by two culverts with dry passage for great crested newts to maintain connectivity which would eliminate the effects of severance for this metapopulation. A further eight dedicated great crested newt underpasses and 15 suitable general use underpasses would maintain connectivity for great crested newts along the route of the road.

7.2.3 All potential great crested newt waterbodies within 250m of the construction corridor would be re-surveyed prior to commencement of the works as required to ensure survey data is current and the presence or absence of great crested newts determined.

7.2.4 Where construction activities are likely to adversely affect the functions of great crested newt waterbodies and terrestrial habitats, translocation under licence from Natural England would be undertaken.

7.2.5 Translocation would require the granting of a European protected species mitigation licence from Natural England. The following features are likely to be required by Natural England before a mitigation licence would be granted:

- general terrestrial habitat improvement may be required where the surrounding land is currently in agricultural use. This would involve scarification/ground preparation and seeding with an appropriate wild flower grass seed mix, and would require to be established to fulfil its function as newt terrestrial habitat;
- trees would be planted where none exist to provide cover and would be set back from the waterbody edge (to be not within 5m of the waterbody bank top);
- hibernacula creation would be included in this design - specifications are available in English Nature (2001);
- appropriate marginal and aquatic plants would be planted to aid establishment of suitable waterbody habitats; and
- great crested newt mitigation areas would be stock-proof fenced and warning signs for deep water put in place.

7.2.6 Where habitat improvement is required, this would be timely (normally a minimum of six months in advance of translocation), allowing suitable habitats to become established prior to translocation.

7.2.7 Durable temporary amphibian fencing (TAF) would be installed prior to translocation where a mitigation area is in close proximity to the works area, in order to prevent newt mortality.

7.2.8 Capture and translocation would take place between February and October. Translocation would likely require the provision of TAF within newt habitat at a distance of 250m from the impact. Fencing would conform to Natural England (2001) guidelines. For a small population a minimum of 50 traps/hectare and a minimum of 30 nights of trapping would be required in suitable weather conditions until there are five nights clear with no great crested newt trapped (English Nature, 2001). Guidelines for trapping effort are shown in Table 7.1.

Table 7.1 Great crested newt trapping parameters

Population size class	Minimum pitfall trap density per ha	Minimum number of trapping nights
Small	50	30
Medium	80	60
Large	100	90

7.2.9 Traps would be checked daily before 11am and any amphibians captured would be moved to the appropriate great crested newt mitigation area as soon as possible. A record of all great crested newt captures would be maintained.

7.2.10 Some breeding waterbodies that would not be directly impacted by the scheme may be sufficiently close to the works that there would be a potential for animals to enter the works site. These work sites would be fenced to English Nature (2001) specifications to prevent injury or death of newts originating from the waterbodies.

7.2.11 Where breeding waterbodies or mitigation areas are within 250m of the new carriageway, linear roadside planting would be provided to guide great crested newt to dry crossings under the scheme.

7.2.12 A large number of waterbodies in the vicinity of the scheme have been assessed for their suitability for supporting great crested newt. Many of these are of below average suitability, but there is potential for improvement through enhancement works, including planting of appropriate vegetation.

7.2.13 In addition, balancing waterbodies and swales would be designed to have a secondary biodiversity function that would result in an increased availability of potential breeding sites for great crested newts. Sustainable urban Drainage Systems (SuDS) waterbodies would be designed to have a secondary wildlife function.

7.3 Reptiles

7.3.1 The surveys have revealed the site to be of low significance for reptiles with two species, grass snake and common lizard, being found in localised areas and in small numbers.

7.3.2 Pre-construction surveys would be conducted for populations at Buckden Gravel Pits and the NIAB to update the current surveys due to the delay before the start of construction. Pre-construction surveys of populations north of Brampton Hut are not proposed as there will not be much time delay between completion of the surveys in 2014 and the start of construction and therefore the population is unlikely to have changed.

7.3.3 Mitigation measures aim to ensure that reptiles are not killed or injured during works and that their local conservation status is maintained.

7.3.4 A generic method statement would be developed to ensure the protection of reptiles and to specify the actions necessary if reptiles are encountered during construction (see *Appendix 20.1 in Volume 3 of the ES*). Best practice dictates that a detailed methodology is produced to demonstrate compliance with the relevant legislation.

7.3.5 Key elements of the method statement would be the specification of displacement or translocation methods. In the latter case the identification and careful management of an appropriate receptor site would be required.

7.3.6 The primary approach to reptile mitigation would be displacement, but only where suitable habitat exists adjacent to a known reptile location. Where a displacement strategy is not appropriate translocation to a prescribed receptor area would be considered. The approach would be determined at detailed design stage. Both scenarios are presented in the following sections. Habitat manipulation would be utilised to displace reptiles from an area subject to disturbance into an adjacent undisturbed area in order to protect animals from mortality. This is achieved by cutting and clearance of vegetation in stages towards the direction of the receptor area. All vegetation management work would be supervised by an ecologists and/or the ecological clerk of works (ECoW) (see *Appendix 20.1 of the ES*).

7.3.7 Artificial cover objects (ACOs) would be left in areas of identified reptile habitat. They would be checked during appropriate weather conditions and reptiles collected. The ACOs would then be removed as vegetation clearance progresses.

7.3.8 Prior to either displacement or translocation, if suitable habitat does not exist, habitat enhancements would be conducted in lands within the DCO boundary to ensure suitable habitats structure and composition and would include the creation of hibernation features outside of floodplains, such as log piles and artificial hibernacula.

7.3.9 Where habitat enhancements are required to a receptor site to create habitat capable of supporting the species of reptile that are to be translocated, these need to be carried out prior to the reptiles' release. This is important to allow the habitat time to establish structural diversity and sufficient prey for the reptiles to establish. In some situations, habitat creation/management would need to be carried out more than a single growing season in advance of the translocation/displacement, but this would need to be assessed on a case by case basis.

7.3.10 Where reptiles cannot be accommodated within the development footprint, then off-site receptor sites would need to be identified. The precise method of translocation is greatly dependant on the nature of the construction programme and the phasing of development. Important factors include the extent of working area associated with each phase and the nature of habitat within it.

7.3.11 The identification of the receptor site would also need to take into account the following criteria:

- as close to the application site as possible.
- as a minimum, the size of the receptor site would be the same as that which is to be lost. In exceptional cases, the receptor site may be smaller than the area to be lost, but only where there is substantial increase in habitat quality so that there is sufficient capacity for the affected reptile population(s). The function of the receptor site is to replicate that which is to be lost.
- the aspect and other environmental conditions should mimic, as closely as possible, those which are to be lost from the application site and provide similar features such as, for example, waterbodies, structural diversity of habitat and thermal (microclimate) and hydrological conditions. The presence of water is vital to the ecology of grass snake.

7.3.12 Vegetation clearance, either for displacement or translocation purposes, would first be cut with hand tools (e.g. strimmers/brush cutters and chain saws), with cut material removed from the site and the remaining habitat would be cleared with machinery. Finally a destructive search would commence and finish before the end of autumn due to the potential of reptiles entering into hibernation over winter.

7.3.13 In areas where reptiles are known to be present, artificial refuges would be used for capture. The species would be moved to suitable areas. Rubble, rock and wood piles suspected of being used as reptile refugia would be carefully dismantled by hand to capture reptiles.

7.3.14 Trees, shrubs and other vegetation would be cut close to ground level, avoiding disturbance to root buttresses of hedges and trees.

7.3.15 Clearance would only be undertaken when ecologists are present in order to capture any reptiles seen during the clearance. If specific items of work can be undertaken without an ecologist's supervision this would be agreed in advance on site and confirmed in writing.

7.3.16 The cut vegetation would initially be stacked on site in areas agreed by the ecologists. It would not be burned within the site, to avoid the risk of reptiles finding the piles and using them as refugia before the vegetation is burned.

7.3.17 In the final stage of the destructive reptile search, tree stumps; concrete waste and other debris on site are to be removed. These are features that could provide refugia for reptiles. The ecologists would search these features before the contractors remove them using machinery.

7.3.18 Any reptiles found during the site clearance would be removed to adjacent areas or if required transported to a receptor site.

7.3.19 There is potential for conflict in relation to the timing of vegetation removal works for water vole and reptiles– where both are located in close proximity to Alconbury Brook.

7.3.20 Vegetation clearance when reptiles may be hibernating represents a high risk activity for potential for killing and injury. Timing of such works would be required to prevent an offence occurring. Vegetation clearance would be organised in such a way to avoid areas where reptiles may be present during the winter period.

7.4 Birds

7.4.1 Mitigation would be designed to avoid disturbance of birds during the breeding season. The clearance of habitats, which have known potential to support nesting birds, would take place outside the breeding season, i.e. it would take place between September and February inclusive.

7.4.2 Pre-construction surveys and checks would be carried out, within and outside the area from which habitats have been cleared, to ensure that there would be no disturbance of *Schedule 1* breeding birds in the vicinity of the works.

7.4.3 If habitat clearance or structure demolition is unavoidable within the bird nesting period (March to August inclusive) this would only be done under the guidance of an experienced ecologist or ecological clerk of works. Clearance and demolition would only be permitted if it can be demonstrated that the works would not interfere with the activities of any nesting birds that are in the affected area. In the case of barn owl this may require the protection of sufficient foraging area in the vicinity of the nest site to enable the birds to fledge their young.

7.4.4 Vegetation clearance would be timed to avoid conflict with removal of trees that have bat roost potential and require soft felling.

7.4.5 In the event of the pre-construction surveys confirming the absence of nesting birds in areas scheduled for clearance or demolition at a later date, measures to prevent occupancy would be implemented, subject to consultation with Natural England, e.g. maintaining short grass areas throughout the nesting period to deter ground nesting birds, deterrents to birds potentially nesting in buildings.

7.5 Badger

7.5.1 A pre-construction walkover would be conducted to ascertain the presence of active badger setts within the zone of impact of the scheme.

7.5.2 At the detailed design stage, each sett would be assessed to determine the potential level of disturbance at construction and operational stages of the scheme and the nature of mitigation required in line with the final scheme design. Judgment would be exercised as to whether proposed actions may or may not cause disturbance to badgers and this is particularly relevant where known badger setts are located in proximity to the road, groundworks and landscaping areas. The level of mitigation would be determined on a case by case basis. In many cases potential disturbance of an occupied sett would be managed by implementing sensitive construction working practices in the vicinity of the sett and by the placement of exclusion fencing. In these cases a method statement would need to be developed detailing the approach to ensuring avoidance or minimising disturbance to a sett.

7.5.3 In situations where disturbance is judged to be unacceptable by an experienced ecologist and where a sett will be interfered with an application to Natural England for a development licence would have to be made.

7.5.4 A license would be required for both temporary closure (the duration of the disturbance activities) and permanent closure. In the scheme this would apply to a small number of setts. Normally Natural England will only approve sett closure licences to be undertaken outside of the breeding period (end of November until end of June).

7.5.5 Where a main sett is to be destroyed, an artificial sett of suitable dimension would be required.

7.5.6 The licensed destruction of an occupied sett would necessitate the exclusion of the resident badgers, again under licence. In order to ensure that the excluded badgers from a main sett have an alternative sett to go to, and that they are familiar with the artificial sett, timing is critical. The artificial sett would therefore be constructed well in advance of exclusion of a main sett. In all cases, badgers would be allowed time to familiarise with the new sett and it would be demonstrated that the sett has been occupied by the social group for which it is intended.

7.5.7 Artificial setts would be located within the appropriate social group territory, and would be within land under the management of Highways Agency or under a legal agreement with the landowner to ensure ongoing management for an agreed period.

7.5.8 A site would be selected as close to the existing sett(s) and/or area of badger activity as is practicable in order that badgers can locate the replacement sett without difficulty. However, the site would not be so close to the new development that disturbance could deter badgers from using it.

7.5.9 The size of the site required for artificial sett construction would depend upon the size of the natural sett which it replaces. Regardless of the artificial sett size, a minimum area of 30m radius would be demarcated from the outlying holes of the artificial sett to prevent damage and disturbance.

7.5.10 The structure would have adequate chambers and tunnels which replicate as much as possible the bulk of the natural sett it replaces.

7.5.11 A mechanical digger is normally used to prepare the site and the amount of soil excavated during this procedure can necessitate a construction area considerably larger than the dimensions of the artificial sett itself. In addition the construction area of the artificial sett would need to accommodate large plant.

7.5.12 The exact shape of the sett would be varied to accommodate local topography. Artificial sett design is flexible and would be addressed on a case by case basis at detailed design.

7.5.13 Site selection would ensure that there would be sufficient drainage to avoid the artificial sett becoming flooded. There would be a depth of at least 1m of soil above the chambers.

7.5.14 Details of sett design are available and would depend upon the size and status of the setts being replaced. The design for the artificial sett would be agreed in advance with Natural England.

7.5.15 Excluding badgers from a sett under licence takes time – typically a licence would require that exclusion methods, such as one-way badger gates, are in place for a minimum period of 21 days following the last sign indicating possible access by badgers to the sett.

7.5.16 Once a licence has been received, setts to be closed would be excluded by the erection of one way gates on each entrance. Fencing and wire mesh may also be required to increase the efficacy of the exclusion, based on topography, substrate and the sett status.

7.5.17 The gates would be monitored three times a week until a period of 21 days has passed during which no activity is noted at the excluded entrances.

7.5.18 After a period of 21 days of no activity, sett closure would commence.

7.5.19 Tunnels and entrances would be progressively excavated with a mechanical digger. The licenced ecologist would identify the direction of the tunnel and inform the driver where next to dig.

7.5.20 The excavation would be conducted in such a way as to ensure that no elements of the tunnel system and chambers are left.

7.5.21 On completion, the excavated area would be backfilled and the ground compacted.

7.5.22 On a case by case basis, determined at the detailed design stage, badger fencing would be erected to prevent badgers from re-entering and potentially re-excavating setts.

7.5.23 Setts that may be temporarily disturbed, may only require temporary exclusion (again under licence). In such cases, the exclusion of the sett would be carried out as above and the gates removed once the potential for disturbance has passed.

7.5.24 In other cases, temporary exclusion may not be required but the potential for disturbance (as per guidance in Natural England (2009b)) may still arise. In such situations a licence may be granted to conduct the works under a licensed ecological watching brief whereby a licence would be granted to ensure that no disturbance or interference occurs during works.

7.5.25 All contractors/site staff would receive a 'Tool Box Talk' on the potential presence of badgers at the site prior to the works commencing, this would cover their responsibilities and any specific required working methods and they would be briefed on the procedure to follow should a potential sett be located or if field signs are discovered within the working areas.

7.5.26 During exclusion of setts, the licensed ecologist or their accredited agent would monitor the works.

7.5.27 The area would be marked out prior to commencement of works so that the contractors are aware of the restricted area.

7.5.28 The ecologist would work closely with the contractors to ensure that disturbance in these areas is minimised and that the conditions of the licence are followed.

7.5.29 Regular checks would be made by the licensed ecologist or accredited agent within the working area for the presence of any new setts or tunnels that may be affected by the works.

7.5.30 As a condition of the licence post construction monitoring would be required and should be considered at the detailed design stage.

7.6 Bats

7.6.1 As a result of the scheme, a maximum of nine bat roosts would be destroyed. As bats are European protected species, this is a licensable activity under the *Conservation of Habitats and Species Regulations 2010 (as amended)*.

7.6.2 For Nationally Significant Infrastructure Projects involving the removal of bat roosts, a mitigation licence would be required. During detailed design a full draft licence application would be submitted, including a Method Statement.

7.6.3 Habitat mitigation would be provided through the landscape planting proposed for the scheme. This would be on a "like for like" basis as far as possible where linear features (tree lines, hedgerows and rivers) are used to and from roost sites which are to be retained and to allow for integration of new roosts into the remaining landscape.

7.6.4 It is also proposed that specific "bat hop-overs" are planted to ensure habitat connectivity from bat roosts.

7.6.5 The lighting design for the scheme would minimise lighting disturbance to bat species and follow the recognised guidance *Bats and Lighting in the UK* (Bat Conservation Trust and the Institute of Lighting Engineers, 2008).

7.6.6 Prior to roost destruction, mitigation would be agreed with the wildlife licensing officer, whereby the type, number and location of bat boxes would be agreed. The bat boxes would then be placed into the landscape prior to destruction. The roosts identified on the scheme are summer roosts and as such, if they are to be removed under licence, they would be removed when it is unlikely bat species are present, from October to April.

7.6.7 Prior to removal, the roosts would be inspected by a licensed ecologist to ensure no bats are present before demolition.

7.6.8 Where bats are present, there would be an agreed method statement for how to mitigate the issue, including where the bats would be accommodated if found.

7.6.9 The named ecologist on the bat roost demolition licence would be present to supervise the roost destruction.

7.6.10 The terms of any licensing agreement would state that a report must be submitted to Natural England post destruction no later than two weeks after the expiry of the licence.

7.6.11 The licensee has six months from the date of the licence to ensure all conditions regarding proposed mitigation has been undertaken. If they have not been undertaken or the work has not taken place, a new licence application is required.

7.7 Water vole

7.7.1 The presence of water vole was identified at two locations on the Alconbury Brook within the A1 Alconbury to Brampton Hut Section of the scheme and one site west of Girton.

7.7.2 A precautionary approach would be taken and a programme of mitigation and habitat enhancement would be implemented for this species as presented in *Figure 11.11 in Volume 2 of the ES*. The optimal time of year to conduct works on water vole habitat is late February to April, when the species is active but not breeding. The requirements for reptile compliance at this time of year should also be taken into account when producing Method Statements.

7.7.3 Pre-construction walkovers, to include appropriate sections of all culverted watercourses, would identify areas of watercourse where water vole continue to be present, have colonised or are likely absent. The results of these updating surveys would inform the requirements for mitigation and specifically translocation.

7.7.4 If water voles inhabit the area and burrows are present, translocation of the impacted population would be required and a water vole receptor site be identified within the scheme.

7.7.5 To translocate water vole for conservation purposes the applicant would apply for a Natural England conservation licence. The licence would include a methodology of the proposed works.

7.7.6 The methodology would include:

- details of the planning permission for the scheme;
- details of the water vole survey in the area subject to the development/maintenance proposals;
- statement of why trapping and translocation is considered the most appropriate course of action and why the water vole cannot be accommodated on the site;
- map showing the area which would be affected by the development/maintenance proposal;

- proposed timescale of trapping and releasing water vole;
- methodology for trapping and holding water vole;
- details of the site where water vole would be released, including results of water vole surveys undertaken in the area; and
- management plan for the release site.

7.7.7 The proposed approach assumes in the first instance that water vole burrows are located in an area of Alconbury Brook that is to be lost to the development. It assumes that the development is carried out in such a way that harm to water vole is avoided and risk of disturbance reduced to a minimum, both during construction and in the long term.

7.7.8 Prior to construction/enabling works all watercourses would be resurveyed for signs of water vole, by a suitably qualified ecologist.

7.7.9 All subsequent works in proximity to the Alconbury Brook would be supervised by an ecologist.

7.7.10 Immediately prior to construction/enabling works commencing, a check would be made by an ecologist for any water vole burrows in the banks. If burrows are absent, it can be assumed that water vole are not currently active along this stretch, and works can proceed (in accordance with *Environment Agency Pollution Prevention Guidelines*). To ensure colonisation does not occur bankside vegetation within the area of adoption would be removed by hand strimming to a width of at least 5m.

7.7.11 To ensure the integrity of the watercourse and avoid disturbance to water vole elsewhere, a buffer of at least 5m would be maintained. These areas, under supervision of an ecologist, would be subject to strimming to deter water vole from the working areas and 5m buffer until the development works commence.

7.7.12 Temporary fencing would be used to exclude water vole from working areas close to the Alconbury Brook and other watercourses, as applicable.

7.7.13 If, following the vegetation clearance, water vole and their burrows are recorded, then a trapping and translocation process under licence would be required in accordance with Natural England guidelines and methods set out as per *Water Vole Conservation Handbook* specification (Strachan *et al*., 2011):

- in the event of burrows being located along the affected section, these would be rechecked to ensure that they are not blocked;
- a receptor site would have to be prepared well in advance of translocation, in negotiation with Natural England. In order for the receptor sites to fully establish this could be twelve months in advance of translocation;
- the receptor site would be designed and planted to contain suitable habitat and be in an area not currently inhabited by the species;

- in order to trap, suitable water vole fencing around the site would be erected and a period of translocation would be required in agreement with Natural England. The licensing period would conceivably be for a minimum of one week, with three clear days;
- traps would be of a size agreed with Natural England;
- trapping of water vole is best timed for a period in early spring (March) when the species is generally active and before the onset of their initial breeding season;
- once the translocation has been completed, a destructive search using only hand tools would be undertaken within three days prior to the works commencing to excavate burrows and root systems to ensure that there are no water vole present within the strimmed areas. A plywood fence would be installed at either side of the mitigation area to prevent water vole returning;
- no works involving heavy construction machinery are permitted to occur closer than 10m from the banks of Alconbury Brook, so as to avoid impacts. Lighter plant and hand tools may be used with 5m or closer if water vole are demonstrated as not being present. Standard pollution prevention guidelines and the requirements of statutory consultees would be adhered to;
- areas of the Alconbury Brook where water vole activity has been recorded are to be clearly marked on all construction drawings and on site to prevent any accidental encroachment into these areas during the construction period; and
- no discharges of water to be made into the Alconbury Brook during the construction period; and fuelling of vehicles to occur only in agreed areas where measures are in place to deal with any accident spills.

7.7.14 A buffer zone around areas of the Alconbury Brook within lands made available would be enhanced for water vole as part of the landscape design. Once construction has been completed, the banks would be planted with a mix of suitable, native species and allowed to regenerate. Species would be chosen from the recommended list in the *Water Vole Conservation Handbook* (Strachan *et al*., 2011). Where water vole are present in the vicinity of proposed works, but have not excavated burrows, localised strimming of the development area would also be implemented to prevent the establishment of new burrows. This technique is appropriate in small areas to be developed (e.g. short lengths of culverting) where suitable habitat exists within 50m of the scheme. The low density of water vole in the area indicate that issues of territory would not arise, but this would be fully assessed following pre-construction walkovers, prior to implementation of exclusion by strimming.

7.8 Otter

7.8.1 Evidence of otter was recorded on the major tributaries within the area of the proposed scheme, including Alconbury Brook, Cock Brook and Ellington Brook but no holts or couches were identified. Should this situation remain there would be no licensing requirements.

7.8.2 Pre-construction surveys, to include the relevant sections of all major tributaries, would determine whether there are any holts that have been created in the intervening period between surveys and the construction of the scheme. The results of these surveys would inform the approach to mitigation and the necessity for an application to Natural England for a mitigation licence.

7.8.3 As otter is a European protected species, this is a licensable activity under the *Conservation of Habitats and Species Regulations 2010* (as amended).

7.8.4 In the absence of any otter holts or couches along the scheme route, a combination of wildlife crossing points and planting used to ensure otters can move around the site without having to go onto the scheme has been designed.

7.8.5 In the event of an otter holt being discovered, all work in the area would stop and Natural England would be consulted on the way forward.

7.8.6 The disturbance of any discovered holt would be a licensable activity and discussions with Natural England would take place. Normally an EPS mitigation licence application would be required.

7.8.7 In addition to meeting the three *Conservation of Habitats and Species Regulations 2010* tests, the applicant would provide the following information:

- a summary of the proposals (scale and nature of the proposed activity);
- details of the number and holt type; and
- details of the consents required, if they have been given yet and the contact details of the consenting authority.

7.8.8 The exclusion and closure procedure is similar to the procedure described for badger. The licence to remove the holt would be required well in advance of the commencement of the construction phase.

7.8.9 Exclusion should be achieved through gating known entrance points and monitoring to check all otters have been excluded.

7.8.10 Once monitoring has confirmed the holt has been vacated, the entrances would be blocked. At this time a replacement holt would be installed at suitable nearby locations to serve as alternative accommodation.

7.8.11 An artificial holt may be required. The status of the holt would also need to be determined. The requirements for a breeding holt (natal den) would be more onerous than a transient holt which may not be occupied all year. To ascertain the status of a holt additional survey may be required. The use of camera traps at a holt entrance may also be a licensable activity as it could constitute a disturbance.

7.8.12 As wildlife can be extremely mobile and absence of a species can never be totally confirmed, it is advised that removal of vegetation should be conducted with caution. In the event that otter or associated signs are discovered on site once works have commenced, works in that area should stop immediately and advice be sought from an experienced ecologist or Natural England.

7.9 Freshwater fish

7.9.1 Avoidance of impact is the first principle to be adopted in relation to fish protection. Further mitigation/compensation should be a last resort.

7.9.2 The scheme has been designed to avoid habitats (aquatic and terrestrial) of known or designated nature conservation interest.

7.9.3 There are no specific compliance actions required for the species of principal importance, but the incorporation of appropriate river restoration techniques to maximise benefits for habitats and species when realigning watercourses would be undertaken (refer to *Chapter 17*).

7.9.4 The following measures should be adhered to:

- adoption of Construction Industry Research and Information Association (CIRIA) guidance in particular *CIRIA C650 - Environmental Good Practice on Site (2nd Edition)* (CIRIA, 2005), *CIRIA C532 - Control of Water Pollution from Construction Sites* (CIRIA, 2001) and *CIRIA C648 - Control of water pollution from linear construction projects* (CIRIA, 2006);
- application of the Environment Agency's Pollution Prevention Guidelines (PPG) in particular PPG01, PPG06, PPG13, PPG18, PPG22 and PPG23;
- ensuring that the necessary consents for working in proximity to watercourses are obtained;
- minimise temporary and permanent culverting and impoundment of watercourses. Where unavoidable, the design would meet current best practice design (e.g. *Design Manual for Roads and Bridges Volume 10, Section 4 Nature Conservation, Parts 1-7* (Highways Agency *et al*., various publication dates) to minimise impact on the watercourse and maximise suitability to provide safe passage for fish species and wildlife in general; and
- notify the Environment Agency of any action likely to impact on the migration of eels, either temporarily or permanently, and work toward resolution by sensitive design and implementation of construction and operational works.

7.10 Controlled species

7.10.1 The main requirement for compliance with the *Wildlife and Countryside Act 1981 (as amended)* is to prevent the spread of *Schedule 9* Plant species and to not “cause to grow in the wild” and the spread and reintroduction of the invasive aquatic invertebrate signal crayfish. Thus mitigation would initially relate to prevention of spread.

7.10.2 Pre-construction surveys would be undertaken to record the location and extent of invasive species within all works areas, e.g. Japanese knotweed and this would inform the preparation of an invasive species control method statement (to include waste management strategy).

7.10.3 Implement the measures contained within the method statement (under ecological supervision) during advanced mitigation and construction phase.

Japanese knotweed

7.10.4 Specific areas within the scheme working area where it is known there are stands of knotweed with potential to be disturbed or removed during construction of the scheme would be identified for control and management.

7.10.5 A pre-construction walkover of the site is required to fully map the location of Japanese knotweed and identify areas of infestation and the risk of spread to the scheme.

7.10.6 Areas of Japanese knotweed would be clearly marked on all construction drawings.

7.10.7 Plans should be developed to control and if possible eradicate Japanese knotweed in consideration with the best practice guidance publication *Managing Japanese knotweed on development sites: the knotweed code of practice. 3rd Edition* (Environment Agency, 2013).

7.10.8 Areas of Japanese knotweed should be clearly marked with hazard warning tape to a width of at least 7m from the outermost plant.

7.10.9 The presence of Japanese knotweed on site should be highlighted to all contractors and form part of a site induction.

7.10.10 If Japanese knotweed is present in an area there should be no tracked excavators entering the 7m exclusion zone.

7.10.11 Haulage routes in area of Japanese knotweed should be clearly demarcated and strictly adhered to.

7.10.12 If haulage routes are must pass through exclusion zones appropriate methods to prevent contact with the soil must be implemented. Although such a haulage route should be avoided if at all practicable.

New Zealand pigmyweed and Canadian pondweed (Aquatic invasives)

7.10.13 Ponds and other waterbodies that have the potential to be disturbed and allow a distribution pathway for this species should be identified and managed and controlled in accordance with the *Great Britain non-native species secretariat guidance (GBNNSS, 2011 and GBNNSS, 2012)*.

7.10.14 The Centre for Ecology and Hydrology has developed *Information Sheet (7): Elodea canadensis (Canadian Pondweed)* (Newman & Duenas, 2010) detailing mechanical, chemical, biological and environmental control measures applicable to managing this species.

7.10.15 Waterbodies containing aquatic invasive species would be clearly marked on all construction drawings.

7.10.16 Waterbodies containing aquatic invasive species should be clearly marked with hazard warning tape.

Translocation of great crested newt

7.10.17 Should there be requirement to relocate great crested newt from waterbodies that contain either New Zealand pigmyweed or Canadian pondweed to other waterbodies, care should be taken not to carry and spread fragments of these plants. These species can reproduce, grow and establish a foothold from only small fragments of vegetative material. Fragments may potentially be transported on great crested newt or in transport waterbody water or mud. Great crested newt should be inspected for fragments and cleaned prior to transportation in clean uncontaminated conditions.

Movement and spread of signal crayfish

7.10.18 Signal crayfish may be encountered during constructional works to ponds and other waterbodies in the vicinity of the scheme. Under the supervision of an experienced ecologist or the ecological clerk of works animals should be collected and retained and humanely destroyed in accordance with recognised guidance.

7.10.19 Guidance would be issued via the invasive species control method statement in relation to controlling the spread of this species and the fungal disease for which it is a vector. Strict bio-hygiene practices would be adhered to when working in all waterbodies on the scheme.

7.10.20 Any trapping of signal crayfish would be undertaken in consultation with the Environment Agency and through their local consenting process.

8 Conclusion

8.1.1 Compliance with the relevant legislation has been a key element of the ecological impact assessment of the scheme. A phased approach has been taken in assessing the ecological interest of the scheme and this involved desk-based reviews and updating field surveys in 2013 and 2014.

8.1.2 The environmental statement concluded the scheme would have a neutral to slight positive effect on ecological features and biodiversity as a whole due to the benefits of habitat creation, whilst adverse effects cannot be ruled out specifically for birds and bats, as a result of disturbance during operation and for bats as a consequence of vehicle collisions.

8.1.3 Permanent, moderate adverse effects are predicted as a result of disturbance for breeding birds of County value during the operational phase of the scheme. This assessment is considered precautionary (i.e. effects may be neutral rather than adverse) given the lack of certainty over how birds would respond/habituate to traffic noise over time and how they would utilise habitats created as part of the scheme. Likewise, due to the uncertainty over how bats respond to traffic noise, permanent, moderate adverse effects are also considered probable for bats in respect of disturbance during operation

8.1.4 It has been determined that the scheme would be delivered in full compliance with all relevant legislation for the identified protected and controlled species.

8.1.5 The compliance mitigation as detailed in Section 7 is summarised in Table 8.1. *Appendix 20.1* should be read in conjunction with this Appendix and this also reflects the commitment to ensuring compliance mitigation is appropriate and robust and is implemented in full. There is full commitment to ensuring the construction programme takes into account compliance mitigation and the necessary time to implement it is fully integrated and embedded in the scheme programme.

8.1.6 The requirements for mitigation land, e.g. receptor areas, are recognised and there is a commitment to ensuring it is available for mitigation use and protected during construction. Habitat enhancement works on mitigation land would be implemented in advance of construction to ensure its availability and appropriate condition when required.

8.1.7 In line with relevant legislation, licensing would be required for works relating to a number of EPS and other protected species, including great crested newt, barn owl, badger and bats. There would be a requirement for licencing work in relation to water vole and otter if pre-construction surveys confirm presence.

8.1.8 The management of controlled species is also critical on this scheme and an invasive species control method statement would guide implementation of mitigation to ensure full legislative compliance.

8.1.9 Consultation with regulators and key stakeholders, including Natural England have been undertaken and would be continued to ensure licencing and mitigation measures are addressed in full.

8.1.10 All licence applications would be conducted in good time to ensure sufficient time is provided to the stakeholders and to ensure that seasonal programming and habitat establishment issues are fully taken into account.

Table 8.1: Summary of compliance with protected and controlled species legislation

Species	Presence in survey area	Licence required?	Key compliance mitigation measures	Compliance achievable?
Great crested newt	No waterbodies in footprint of the scheme. 35 waterbodies with potential associated terrestrial habitat within the survey corridor. Populations all in 'small' to 'medium' size.	Y	Translocation between February and October under licence. Terrestrial habitat improvements and hibernacula creation. Temporary amphibian fencing to be used where a mitigation area is in proximity to the works. Detailed consultations would take place with Natural England.	Y
Reptiles	Peak count of grass snake recorded was two in 2014. A peak count of five common lizard were recorded in 2013	N	Pre-construction surveys. Where works are adjacent to suitable habitat displacement strategy would be used between spring and autumn. In other places, translocation and creation of hibernation features.	Y
Breeding birds	85 breeding bird species. Many wintering birds species. 11 *Schedule 1* bird species recorded including hobby, barn owl, kingfisher and Cetti's warbler are likely to have bred either within the construction corridor or in the close vicinity. Gadwall occur in the survey corridor (designation species of the Ouse Washes SPA, 9.3km to the north-east).	Y – for pre-construction barn owl surveys	All habitat clearance, identified as supporting potential for nesting birds, would take place outside the breeding season, i.e. it would take place between September and February inclusive or under ecological supervision. Pre-construction surveys for *Schedule 1* breeding birds.	Y

Species	Presence in survey area	Licence required?	Key compliance mitigation measures	Compliance achievable?
Badger	Fifteen setts require closure on the scheme (1 main sett, 5 undetermined status, 1 subsidiary & 8 outliers), A further 20 setts require disturbance free buffer areas marked.	Y	Pre-construction surveys. Each sett would be assessed for detailed buffer requirements and level of potential disturbance. Appropriate mitigation against disturbance would be implemented. Artificial setts (to replace main setts) to be constructed in advance of sett exclusions, which would be under licence. Exclusions between the end of June and the end of November. Post-construction monitoring. Detailed consultations would take place with Natural England.	Y
Bats	A maximum of nine tree roosts would be lost as a result of the scheme. 12 species of bat recorded.	Y	Habitat mitigation and “bat hop-overs”. Sensitive design of underpasses and culverts to allow bat use. Bat boxes to be provided ahead of roost destruction. Pre-construction roost inspection and destruction, which would be under licence between October and April. Detailed consultations would take place with Natural England.	Y
Water vole	Positive signs recorded on two sites on the Alconbury Brook plus a possible latrine east of Girton.	Y	Pre-construction surveys followed by hand strimming of vegetation late February to April. All works in proximity to the Alconbury Brook would be supervised by an ecologist. Temporary exclusion water vole fencing. If burrows are found translocation under licence would be required. Habitat enhancement if required. Detailed consultations would take place with Natural England.	Y
Otter	No holts in scheme boundary. Evidence of otter in the wider area.	N	No known holts or couches. As otter are mobile, pre-construction surveys. If found, artificial holts would be provided. Potential requirement to exclude and close holts if found and would be impacted.	Y

Species	Presence in survey area	Licence required?	Key compliance mitigation measures	Compliance achievable?
Freshwater fish	Three notable fish species identified in the watercourses within the scheme footprint	N	Adherence to best practice and guidance on river restoration techniques, and pollution prevention. Adherence to the *Eels Regulations (2009)* and *Salmon and Freshwater Fisheries Act (1975)* consenting, and fishery and habitat protection measures.	Y
New Zealand pigmyweed	Found in three waterbodies	N	Works to be undertaken in line with Centre for Ecology and Hydrology guidelines. To be taken into account in great crested newt translocations to prevent spread.	Y
Japanese knotweed	Found in two locations	Y (for offside disposal)	Exclusion, removal and disposal in-line with Environment Agency guidelines.	Y
Canadian pondweed	Found in many waterbodies	N	Works to be undertaken in line with Centre for Ecology and Hydrology guidelines. To be taken into account in great crested newt translocations to prevent spread.	Y
Signal crayfish	Found in many waterbodies	N	Works to be undertaken in accordance with Environment Agency guidance and in relation to the invasive species control management plan for the scheme.	Y

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