

A40 Over Roundabout

Preliminary Ecological Appraisal

COGL43041188/ ECO1 Revision 0

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1 Introduction

1.1 Background

Amey Consulting Ltd has been commissioned by Gloucestershire County Council (GCC) to carry out a preliminary ecological appraisal to identify potential ecological constraints, along the route of a proposed scheme situated on the A40 Over Roundabout (approximately 2 miles northwest of Gloucester). The works include widening of the carriageway to provide an additional lane on both the A40 westbound and the A417 southbound approaches, as well as widening of the embankments and the construction of retaining walls. For a detailed description of the works refer to section 1.3 of the Full Business Case main document. The location of the scheme is shown in Figure 1.

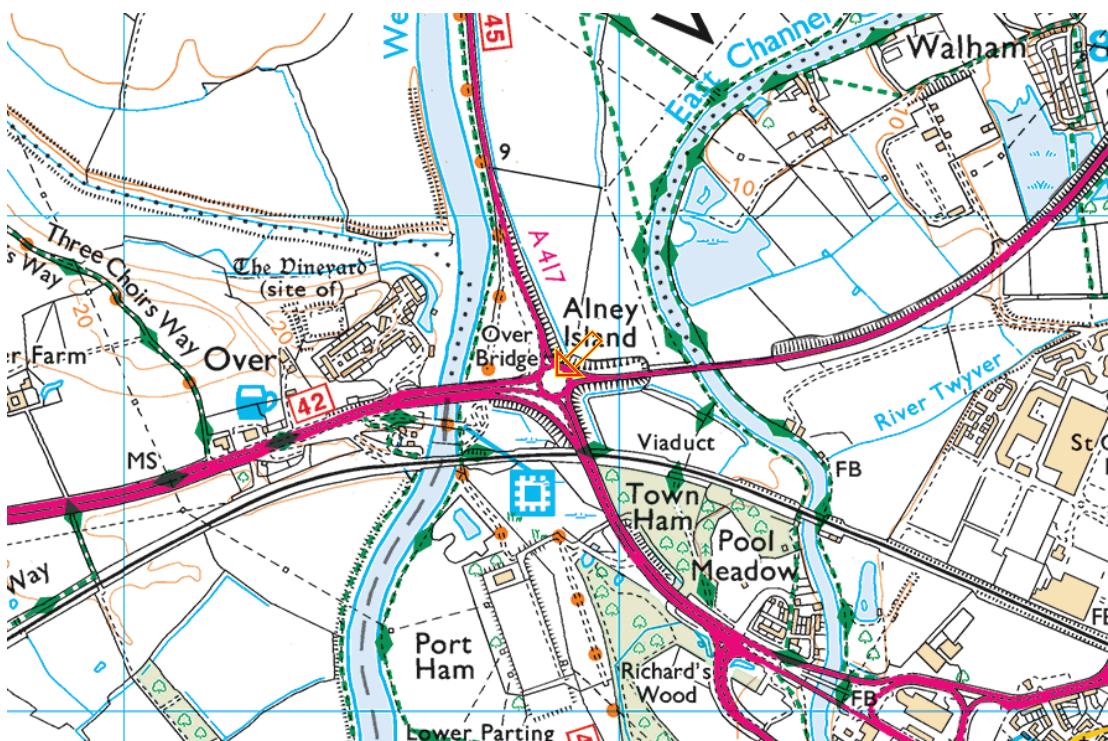


Figure 1: Scheme Location: Over, Gloucester (© Crown Copyright and database rights 2016. Ordnance survey 100022861)

The site was surveyed by an Amey ecologist in September 2016. This report details the survey outcomes. The survey area includes the route of the scheme area and a 50 metre buffer either side of the identified works area (where access was permissible).

The scheme footprint consists predominantly of a thin strip (approximately 1.5m wide) of species poor semi-improved grassland dominated by cock's foot *Dactylis glomerata* with occasional common dandelion *Taraxacum officinale*, creeping buttercup *Ranunculus repens*, ground ivy *Glechoma hederacea*, herb Robert *Geranium robertianum*, ribwort plantain *Plantago lanceolata* and yarrow *Achillea millefolium* with occasional patches of tall ruderals including common nettle *Urtica dioica* and rosebay willowherb *Chamerion angustifolium* and the rest of the embankments consisting of broadleaved plantation woodland dominated by ash *Fraxinus excelsior*, blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna* and willow *Salix sp.* The woodland understory is dominated by bramble *Rubus fruticosus sp.* and common nettle.

Habitat in the wider landscape is dominated by floodplain grazing marsh, arable farmland containing hedgerows and the River Severn.

1.2 Objectives

This preliminary ecological (scoping) appraisal of the site is intended to record relevant habitats, including any that are formally designated for nature conservation, and to highlight the potential for legally-protected or otherwise notable species. This appraisal also makes recommendations for further, detailed surveys that might be required to confirm the presence of such species. This is in order to ensure that further ecological survey and advice is appropriately targeted and reflects the demands of wildlife legislation and Government nature conservation policy (refer to Appendix A for details).

Where this preliminary survey indicates that there may be impacts to such ecologically-sensitive features, a brief, outline indication of likely mitigation requirements is also provided, where appropriate. However, detailed mitigation can only be confirmed once the recommended further surveys are completed (if required).

1.3 Limitations

No limitations during the survey were encountered during the survey.

This report deals with matters of legal significance but does not constitute professional legal advice. The Client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this document and summarised in Appendix A.

2 Methodology

2.1 Desk Study

A desk study of freely available information was undertaken utilising the MAGIC website to establish the presence of statutory conservation sites within 2km of the scheme as well as establishing whether any European Protected Species (EPS) licences have been granted within 2km of the scheme. A data request was also sent to Gloucestershire Centre for Environmental Records (GCER) to obtain information on any protected species records and non-statutory conservation sites within 2km.

2.2 Field Survey

The site was visited by a qualified and experienced ecologist (Robert Randall MCIEEM) on 28th September 2016. Habitats within and immediately adjacent to the proposed scheme footprint were noted and the potential for protected or otherwise notable species was assessed. Where any incidental sightings or indirect evidence of species presence was seen, this was recorded, but no detailed survey for any species was undertaken. The field survey was undertaken in accordance with the handbook for phase 1 habitat survey and this informed the classification of the habitats (JNCC 2010).

3 Results

SITE: A40 Over Roundabout O.S. Grid Ref: SO818196 Figure ref: Figure 1		Project No. : COGL43041188 PROJECT NAME : A40 Over Roundabout SURVEY DATE: 28th September 2016 SURVEYORS: Robert Randall MCIEEM	
Ecological Attributes and Status <i>(see Appendix A for legislation summary)</i>	Description: Presence (actual or potential), level of potential (high, medium, low, negligible), distance and direction from site, locations within site, relevant habitat features, connectivity, etc.	Potential Impacts	Recommendations: Requirement for further survey and/or mitigation. See Appendix B for indicative survey timing.
European Sites (e.g. SPA/SAC/Ramsar designated) within 2km Internationally important and protected by law: <ul style="list-style-type: none"> The Conservation of Habitats and Species Regulations 2010 	There are no European designated sites within 2km of the site.	None predicted.	None recommended.
Sites of Special Scientific Interest (SSSI) designated sites within 2km Nationally important and protected by law: <ul style="list-style-type: none"> Wildlife & Countryside Act 1981 (as amended) 	There are no SSSIs within 2km of the scheme.	None predicted.	None recommended.

<p>Non-statutory conservation sites within 2km</p> <p>Local planning consideration</p>	<p>There are seven Key Wildlife Sites (KWS) within 2km of the site.</p> <p>One of these Alney Island KWS is immediately adjacent to the site outside the highway boundary. This site has been designated for the presence of floodplain grazing marsh, ponds, ditches, lowland meadows, wet woodland and reedbed habitat as well as for its botanical and dragonfly interest. The other six KWSs are between 780m and 1.4km from the scheme. Alney Island and the other KWSs are deemed to be of Medium importance under TAG Unit A3: Environmental Appraisal Criteria</p>	<p>Due to the location of the sites and the scope of the scheme the only site that could potentially be impacted upon is Alney Island KWS. Although the site lies outside of the work area it is immediately adjacent to the work area and in the absence of any mitigation could be subjected to accidental damage by pollution or unsympathetic storage of materials.</p>	<p>It is recommended that no materials are stored adjacent to Alney Island KWS and contractors made aware of its location and aware that no access to this area or storage of materials within this area is allowed without prior approval from an ecologist.</p> <p>Spill kits are to be present wherever diesel or other spillable materials are present and site operatives trained in how to use these in a pollution event.</p> <p>As the KWS is not expected to be impacted and with these mitigation measures in place the magnitude of impact is considered to be neutral.</p>
<p>Notable habitats</p> <p>E.g. those listed under:</p> <ul style="list-style-type: none"> • NERC Act 2006 S.41 	<p>There are no notable habitats within the footprint of the scheme and the poor semi-improved grassland and broadleaved plantation woodland is classified as of Low importance under TAG Unit A3: Environmental Appraisal Criteria.</p>	<p>The habitat within the footprint of the scheme is considered to be of low importance and recreatable if this habitat needs to be impacted.</p> <p>The removal of the habitat is likely to result in a short term minor negative magnitude of impact.</p>	<p>It is expected that in the medium term, seeds already present in the bank will germinate and saplings will grow due to the available space. Trees/shrubs to remain will be protected during construction to retain the positive visual amenity.</p>
<p>Hedgerows</p> <ul style="list-style-type: none"> • Hedgerow Regulations (1997) and also the UK Biodiversity Action Plan. 	<p>There are no hedgerows present within the footprint of the scheme.</p>	<p>None predicted.</p>	<p>None recommended.</p>

<p>Notable plants</p> <p>Some may be protected under:</p> <ul style="list-style-type: none"> Wildlife & Countryside Act 1981 (as amended) <p>The Conservation of Habitats and Species Regulations 2010 or listed under:</p> <ul style="list-style-type: none"> NERC Act 2006 UK Red Data Book 	<p>No notable (protected) plants were found during the site visit and no invasive plant species listed under Schedule 9 were found on site.</p>	<p>None predicted.</p>	<p>None recommended.</p>
<p>Bats</p> <p>Protected by law:</p> <ul style="list-style-type: none"> The Conservation of Habitats and Species Regulations 2010 Wildlife & Countryside Act 1981 (as amended) <p>Listed under:</p> <ul style="list-style-type: none"> NERC Act 2006 	<p>There are semi-mature trees present on site, however none of these are considered to offer bat roost potential and are all classified as negligible regarding bat roost potential, however the broadleaved plantation woodland habitat provides good quality foraging habitat for bats.</p>	<p>If the work is undertaken at night the use of artificial lighting may have a negative impact upon bats. Removal of the broadleaved plantation woodland could potentially reduce the amount of foraging habitat in the area. However, the amount of habitat potentially impacted is considered to be negligible compared to the amount of other suitable foraging habitat in the wider landscape.</p>	<p>It is recommended that the work should be undertaken during the day to negate the use of artificial lighting. If the work needs to be undertaken at night mitigation measures to minimise impacts on bats will need to be utilised such as directional lighting and louvers to minimise light spill into the broadleaved plantation woodland habitat.</p> <p>The removal of broadleaved plantation woodland is likely to have a short term minor negative impact upon bats. However, the erection of bat boxes on mature trees in the wider area of this scheme could have a medium to long term positive impact upon bats.</p>
<p>Hazel dormouse (<i>Muscardinus avellanarius</i>)</p> <p>Protected by law:</p> <ul style="list-style-type: none"> The Conservation of Habitats and Species Regulations 2010 Wildlife & Countryside Act 1981 (as amended) <p>Listed under:</p> <ul style="list-style-type: none"> NERC Act 2006 	<p>The habitat on site is considered sub-optimal for hazel dormouse and the habitat is isolated from potential suitable habitat in the wider landscape. Therefore hazel dormouse is considered to be absent from the scheme footprint.</p>	<p>None predicted.</p>	<p>None recommended.</p>

<p>Nesting birds</p> <p>Protected by law:</p> <ul style="list-style-type: none"> Wildlife & Countryside Act 1981 (as amended) <p>Some may be listed under:</p> <ul style="list-style-type: none"> NERC Act 2006 RSPB Birds of Conservation Concern 	<p>There is high potential for nesting birds within the broadleaved plantation woodland.</p>	<p>Removal of habitat during the period March to September, inclusive, risks damaging active bird nests of common species during the main breeding season.</p>	<p>Habitat clearance should take place in the months September-February, outside of the main bird breeding season; if possible. If any vegetation clearance is required during the breeding season (March-August) then an inspection for active nests must be made within 24 - 48 hours prior to cutting. If a nest is found, works will need to be delayed at this location until the chicks have fledged.</p> <p>The removal of broadleaved plantation woodland is considered to have a minor negative impact upon nesting birds. However the erection of bird boxes and trees not impacted by the scheme could result in a positive impact.</p>
<p>Badger (<i>Meles meles</i>)</p> <p>Protected by law:</p> <ul style="list-style-type: none"> Protection of Badgers Act 1992 	<p>The habitat on site and in the surrounding habitat is optimal foraging and sett building habitat.</p> <p>An inactive five entrance badger sett was found on the westbound A40 embankment at approximately SO819196. Mammal runs are present within this embankment which may be utilised by badgers but no evidence of badger activity was present such as latrines, footprints or guard hairs.</p>	<p>Badger foraging and commuting routes could be impacted by the scheme. Badgers are not considered to be a biodiversity priority, but their active setts and the animals themselves are protected under UK legislation for welfare reasons and at present no setts are going to be impacted by the scheme.</p>	<p>It is recommended that the badger sett is re-surveyed prior to construction to ensure that it is still inactive. If the badger sett has become active a licence from Natural England will be required to disturb the sett prior to construction.</p> <p>As a precaution it is recommended that any excavations present on site that are left overnight have graded edges to allow any badgers that may fall in the excavation to leave.</p> <p>As badgers are not of biodiversity importance and the sett is currently inactive the magnitude of impact of the scheme on badgers is considered to be negligible.</p>

Reptiles Protected by law: <ul style="list-style-type: none"> Wildlife & Countryside Act 1981 (as amended) Listed under: <ul style="list-style-type: none"> NERC Act 2006 	The poor semi-improved rough grassland section is considered suitable habitat for reptiles. However, it is only 1.5m in width and may be too small to be utilised by reptiles. The broadleaved plantation woodland is suitable hibernation habitat for reptiles. However, the habitat is isolated from suitable reptile habitat in the wider landscape and reptiles are considered to be absent. There are records of grass snake, slow worm and common lizard in the wider landscape within 2km of the site.	None predicted.	None recommended
Great crested newt (GCN) (<i>Triturus cristatus</i>) Protected by law: <ul style="list-style-type: none"> The Conservation of Habitats and Species Regulations 2010 Wildlife & Countryside Act 1981 (as amended) Listed under: <ul style="list-style-type: none"> NERC Act 2006 	There are no ponds within 500m of the scheme that aren't separated from the scheme by an impenetrable barrier to newt dispersal (the A40) and therefore great crested newts are considered absent from the scheme area.	None predicted.	None recommended.
Water vole (<i>Arvicola amphibius</i>) Protected by law: <ul style="list-style-type: none"> Wildlife & Countryside Act 1981 (as amended) Listed under: <ul style="list-style-type: none"> NERC Act 2006 	There are no watercourses within the footprint of the scheme or within 10m of the scheme, therefore water vole are considered to be absent.	None predicted.	None recommended.
Otter (<i>Lutra lutra</i>) Protected by law: <ul style="list-style-type: none"> The Conservation of Habitats and Species Regulations 2010 Wildlife & Countryside Act 1981 (as amended) Listed under: <ul style="list-style-type: none"> NERC Act 2006 	There are no watercourses within 10m of the scheme and therefore no impact is anticipated upon commuting and foraging otter habitat. No evidence of an otter holt or couch was found within the broadleaved woodland and otters are considered to be absent.	None predicted.	None recommended.

<p>White-clawed crayfish (<i>Austropotamobius pallipes</i>)</p> <p>Protected by law:</p> <ul style="list-style-type: none">• The Conservation of Habitats and Species Regulations 2010• Wildlife & Countryside Act 1981 (as amended) <p>Listed under:</p> <p>NERC Act 2006</p>	<p>There are no watercourses within the footprint of the scheme or within 10m of the scheme. White-clawed crayfish are considered to be absent.</p>	<p>None predicted.</p>	<p>None recommended.</p>
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4 Summary Recommendations

The following recommendations have been made in Section 3 based on the results of this preliminary study. These should be implemented with full consideration of wildlife legislation described in Appendix A and seasonal restrictions shown in Appendix B.

Non-Statutory conservation sites – It is recommended that no materials are stored adjacent to Alney Island KWS and contractors made aware of its location and to aware that no access to this area or storage of materials within this area without prior approval from an ecologist.

Spill kits are to be present wherever diesel or other spillable materials are present and site operatives trained in how to use these in a pollution event.

As the KWS is not expected to be impacted and with these mitigation measures in place the magnitude of impact is considered to be neutral.

Habitats - The removal of the habitat is likely to result in a short term minor negative magnitude of impact. It is expected that in the medium term, seeds already present in the bank will germinate and saplings will grow due to the available space. Trees/shrubs to remain will be protected during construction to retain the positive visual amenity.

Bats – It is recommended that the work should be undertaken during the day to negate the use of artificial lighting. If the work needs to be undertaken at night mitigation measures to minimise impacts on bats will need to be utilised such as directional lighting and louvers to minimise light spill into the broadleaved plantation woodland habitat.

The removal of broadleaved plantation woodland is likely to have a short term minor negative impact upon bats. However, the erection of bat boxes on mature trees in the wider area of this scheme could have a medium to long term positive impact upon bats.

Badger - It is recommended that the badger sett is re-surveyed prior to construction to ensure that it is still inactive. If the badger sett has become active a licence from Natural England will be required to disturb the sett prior to construction.

As a precaution it is recommended that any excavations present on site that are left overnight have graded edges to allow any badgers that may fall in the excavation to leave.

As badgers are not of biodiversity importance and the sett is currently inactive the magnitude of impact of the scheme on badgers is considered to be negligible.

Nesting birds - Habitat clearance should take place in the months September-February, outside of the main bird breeding season if possible. If any vegetation clearance is required during the breeding season (March-August) then an inspection for active nests must be made within 48 hours prior to cutting. If a nest is found, works will need to be delayed at this location until the chicks have fledged.

The removal of broadleaved plantation woodland is considered to have a minor negative impact upon nesting birds. However, the erection of bird boxes on trees not impacted by the scheme could result in a positive impact.

5 References

- Chartered Institute for Ecology and Environmental Management (2013) *Guidelines for Preliminary Ecological Appraisal*. CIEEM Winchester, Hampshire.
- Joint Nature Conservation Committee. 2010. Handbook for Phase 1 habitat survey: a technique for environmental audit. JNCC, Peterborough
- All UK (and individual UK countries) legislation can be viewed at: <http://www.legislation.gov.uk/browse>
- Magic Map Application. 2015. [online] Available from: <http://magic.defra.gov.uk/MagicMap.aspx>

Appendix A Wildlife Legislation and Policy

The Wildlife & Countryside Act 1981 (as amended)

Provides for designation and protection of Sites of Special Scientific Interest (SSSI), which are areas that represent the most valuable habitats in the UK for nature conservation.

The Act creates the following offences:

- To intentionally kill, injure, or take any wild bird or their eggs or nests (with exception to species listed in Schedule 2). Special penalties are available for offences related to birds listed on Schedule 1, for which there are additional offences of disturbing these birds at their nests, or their dependent young.
- To intentionally kill, injure, or take, possess, or trade in any wild animal listed in Schedule 5, and interference with places used for shelter or protection, or intentionally disturbing animals occupying such places.
- Certain methods of killing, injuring, or taking wild animals listed in Schedule 6.
- To pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants.
- The release of certain non-native animals and planting of plants listed in Schedule 9.

It also provides a mechanism making any of the above offences legal through the granting of **licences** by the appropriate authorities.

Conservation of Habitats and Species Regulations 2010 (as amended)

The principal means by which the European Habitats Directive is transposed in England and Wales.

Provide for the **designation** and protection of a network of 'European Sites' (also termed Natura 2000), including Special Areas of Conservation (SAC) and Special Protection Areas (SPA).

Regulation 41 creates the following **offences** relating to European Protected Species (EPS):

- deliberately capture, injure or kill any wild animal of a European Protected Species;

- deliberately disturb animals of any such species in such a way as to be likely to:
 - impair their ability to survive, breed, rear or nurture their young, hibernate or migrate, or
 - significantly affect the local distribution or abundance of the species to which they belong;
- deliberately take or destroy the eggs of such an animal; or
- damage or destroy a breeding site or resting place of such an animal.

The Regulations also make it an offence (subject to exceptions) to deliberately pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 5.

However, the actions listed above can be made lawful through the granting of **licences** (European Protected Species Licence) by the appropriate authorities (Natural England in England). Licences may be granted for a number of purposes, but only after the appropriate authority has determined that the following regulations are satisfied:

- the works under the licence are being carried out for the purposes of 'preserving public health and public safety, or for 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 is 'no satisfactory alternative'
- the action 'will not be detrimental to the maintenance of the population of the species concerned at favourable conservation status in their natural range'.

To apply for a licence, the following information is required:

- The species concerned.
- The relative size of the population at the site (note this may require a survey to be carried out at a particular time of the year).
- The impact(s) (if any) that the development is likely to have upon the populations.
- What measures will be conducted to mitigate for the impact(s).

Natural Environment & Rural Communities (NERC) Act 2006

Section 40 of NERC carries an extension of the earlier CRoW Act biodiversity **duty to public bodies and statutory undertakers** to ensure due regard to the conservation of biodiversity. Section 41 requires the Secretary of State, as respects England, to publish a list of species and habitats which are of 'principal importance for the purpose of conserving biodiversity'. These lists generally reflect the species and habitats previously listed under the UK Biodiversity Action Plan.

The Protection of Badgers Act 1992

This makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so and to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it.

Under Section 10 (1)(d) of the Protection of Badgers Act 1992, a licence may be granted by Natural England to interfere with a badger sett for the purpose of development, as defined by Section 55(1) of the Town & Country Planning Act 1990.

The Wild Mammals (Protection) Act 1996

The Wild Mammals (Protection) Act 1996 makes it an offence for any person to mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.

The Animal Welfare Act 2006

This imposes a duty of care on anyone responsible for an animal to take reasonable steps to ensure that the animal's needs are met. This means that a person has to look after the animal's welfare and ensure that it does not suffer. The Act says that an animal's welfare needs include:

- a suitable environment;
- a suitable diet;
- the ability to exhibit normal behaviour patterns;
- any need it has to be housed with, or apart from, other animals; and

- protection from pain, suffering, injury and disease.

With regards to development, this may have implications when capture and translocations of animals are proposed.

The Hedgerows Regulations 1997

The Hedgerows Regulations 1997 were introduced to protect important hedgerows from destruction. However the legislation does not apply to any hedgerow that is within or marking the boundary of the curtilage of a dwelling house.

For the Regulations to be applicable, the hedgerow must be at least 20 metres in length or, if less than 20 metres, it must meet another hedgerow at each end. A hedgerow is deemed to be important if it is more than thirty years old and meets at least one of the criteria listed in Part II of Schedule 1 of the Regulations.

If a hedgerow which qualifies under the Regulations is to be removed, the landowner must contact the Local Planning Authority (LPA) in writing by submitting a hedgerow removal notice. The LPA then has a period of 42 days to decide whether or not the hedgerow meets the importance criteria of the regulations.

National Planning Policy Framework

This framework replaces Planning Policy Statement 9: Biodiversity and Geological Conservation (PPS 9) (ODPM 2005b) and sets out the view of central Government on how planners should balance nature conservation with development. One of the key principles of the NPPF is:

The NPPF states that development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas, including biodiversity. It also states that the aim of planning decisions should be to prevent harm to biodiversity conservation interests and to 'promote the preservation, restoration and re-creation of priority habitats, ecological networks and the recovery of priority species'.

Where determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principals; 'if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused'; and, 'planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss'.

This means that full ecological surveys should be carried out and suitable mitigation measures proposed prior to any planning application being submitted.

Biodiversity 2020: A strategy for England's wildlife and ecosystem services

This biodiversity strategy for England builds on the Natural Environment White Paper and the earlier UK Biodiversity Action Plan. It provides a comprehensive picture of how Government is implementing our international and EU commitments and sets out the strategic direction for biodiversity policy up to 2020. Its mission is to:

"halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people."

In relation to planning and development its priority is to:

"take a strategic approach to planning for nature within and across local areas. This approach will guide development to the best locations, encourage greener design and enable development to enhance natural networks. We will retain the protection and improvement of the natural environment as core objectives of the planning system."

Appendix B Survey Calendar

Ecology Survey Timing - Indicative Calendar

Species	Months																
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
Great Crested Newt	Hibernation		Pond surveys	Pond surveys		Pond surveys	Habitat Suitability Assessment only					Hibernation					
Reptiles	Hibernation		Limited activity	Artificial refuge surveys			Reduced basking time		Artificial refuge surveys	Limited activity	Hibernation						
Dormouse	Hibernation			Nest tube/box survey.													
Badger	Limited sett/bait surveys	Bait marking & sett surveys			Sett surveys			Sett surveys			Limited sett/bait surveys						
Bats	Hibernation roost survey			Summer roost & activity surveys							Hibernation roost survey						
Roost potential and close inspections of roosts possible all year. Trees are best inspected (for potential) in winter.																	
Nesting Birds	No to low nesting activity		Nesting activity					No to low nesting activity									
Water voles	Reduced activity			Field-sign surveys							Reduced activity						
Otter	Field-sign surveys		Field-sign surveys	Field-sign surveys													
White-clawed crayfish				trapping restricted													
Botanical				Reduced flowering	Main flowering season			Reduced flowering									

Key to timing:

Optimal survey period

Sub-optimal survey period

Surveys unreliable

NOTE: Timing shown is indicative and may vary depending on weather and region. Some surveys may require licences.