M20 Junction 10a

TR010006

Environmental Statement

Chapter 8 Nature Conservation

APFP Regulation 5(2)(q)

Revision A

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 6.1

July 2016

M20 Junction 10a

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Environmental Statement

Chapter 8 Nature Conservation

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Date: July 2016

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8 Nature Conservation

8.1 Introduction

8.1.1 Ecology can be defined as the study of the interactions of biodiversity and their environment. Nature conservation is concerned with maintaining a favourable conservation status of a species population, habitat or ecosystem. This Ecological Impact Assessment (EcIA) considers the ecological receptors and indirect impacts from noise (Appendix 11.1, Volume 6.3) air quality (Appendices 5.1 – 5.5 and 15.1, Volume 6.3) and landscape (Appendices 7.1–7.5 Volume 6.3) that have the potential to be affected by the proposals for the Main Scheme and the Alternative Scheme, and describes the background data and surveys undertaken with an overview of the methodologies employed

8.1.2 The assessment follows the Design Manual for Roads and Bridges (DMRB), Volumes 10 and 11[1] and the Chartered Institute of Ecology and Environmental Management's (CIEEM) publication 'Guidelines for Ecological Impact Assessment in the United Kingdom' (IEEM, 2006).

8.2 Legislative and Policy Framework

Legislation

8.2.1 International agreements and European Directives that have formed the basis for UK legislation include the following:

- Convention on Biological Diversity (CBD) 1992.
- The Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar) 1971.
- Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979) as amended.
- Bonn Convention on the Conservation of Migratory Species of Wild Animals (1979) as amended.
- Bonn Convention on the Conservation of Migratory Species of Wild Animals - Agreement on the Conservation of Bats in Europe (1999) as amended.
- EC Directive on the Conservation of Wild Birds (Birds Directive 1979) as amended (79/409/EEC).

[1] Highways A (2008) Design Manual for Roads and Bridges, Volume 11 Environmental Assessment Section 2 Environmental Impact Assessment.

- EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (Habitats Directive 1982) as amended (92/43/EEC).

8.2.2 The Conservation of Habitats and Species Regulations 2010 (as amended) (Habitat Regulations) transposes the Habitats Directive 1982 into national law. The Regulations place a duty upon the Secretary of State to identify sites that are important for either habitats or species listed in Annexes I and II of the Habitats Directive. This is considered in the [AIES/HRA] report.

8.2.3 The Habitat Regulations also make it an offence (subject to exceptions) to deliberately capture, kill, disturb or trade certain animals (identified in Schedule 2), or to pick, collect, uproot, destroy or trade in plants listed in Schedule 5.

8.2.4 The main piece of UK legislation on nature conservation is the Wildlife and Countryside Act 1981 (as amended) (WCA). This implements the Bern Convention, transposes the Birds Directive into UK law, and complements the Habitat Regulations by offering protection to wild birds, animals listed on Schedule 5 and prohibits interference with places of rest, or intentionally disturbing some species whilst occupying their resting places. The Act prohibits some methods of killing or taking certain birds and animals, but also makes it an offence to release some animals if captured.

8.2.5 The WCA 1981 is supplemented with the Countryside and Rights of Way (CRoW) Act 2000. This Act strengthens wildlife enforcement by making the reckless disturbance of some species an offence. The Act also makes it an offence to cause the spread of non-native species and places a duty on Government Departments to have regard for the conservation of biodiversity

8.2.6 The Natural Environment and Rural Communities (NERC) Act 2006 requires public bodies, including local authorities, '*to have regard to the conservation of biodiversity in England*' when carrying out their normal functions and to make biodiversity an integral part of policy and decision-making process under Section 40. This is applied via local policies, and is integral to planning decision making. Under Section 41 of the same Act, a list of habitats and species of '*principal importance to biodiversity within England*' was drawn up as guidance for public bodies in implementing their duty.

8.2.7 The Environmental Protection Act 1990 is a framework Act that has been amended by various other Parliament Acts and Regulations. The Act sets out a regime for limiting emissions, regulates disposal of controlled waste. The Act originally created the Nature Conservancy Council for England (English Nature), which was superseded by the NERC Act 2006 to join English Nature with other bodies to form Natural England (NE).

8.2.8 Badgers and their setts are protected under the Protection of Badgers Act 1992. The Act is based on the need to protect badgers from cruelty, not for conservation reasons. However, the Act makes it an offence to intentionally or recklessly interfere, damage, destroy or obstruct a sett; or to wilfully kill, injure, take, possess or cruelly treat a badger or attempt to do so.

8.2.9 The Wild Mammals (Protection) Act 1996 makes it an offence to use a variety of methods to intentionally cause suffering to a wild mammal, unless for the purpose of euthanasia.

8.2.10 The Animal Welfare Act 2006 includes the provision to protect animals from harm, making it an offence if an act or the failure to act causes an animal to suffer, and gives consideration as to whether the suffering could have reasonably have been avoided.

8.2.11 The Hedgerow Regulations (1997) make provision for the identification of important hedgerows which may not be damaged, or removed without permission from the Local Planning Authority.

8.2.12 Under the Pest Act 1954, the whole of England (except the city of London) has been declared a rabbit *Orytolagus cuniculus* clearance area. Land occupiers are obligated to prevent rabbits from causing damage elsewhere.

National Policy

8.2.13 Policies that set out the direction and delivery of nature conservation objectives include Policies that embed nature conservation principles as part of other frameworks, and specific policies for nature conservation.

National Policy Statement

8.2.14 The National Policy Statements (NPS) outline Government policy on major infrastructure and are the primary consideration in decision making. There are 12 NPSs and these influence Local Plans and Development Frameworks. The National Policy Statement for National Networks[2] is pertinent to this Scheme, and sets out the need for and Governments policies to deliver nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England. The NPS provides guidance on environmental impacts. It includes the expectation that impacts to habitats and species would be avoided or mitigated as an integral part of their proposed development in order to protect them from harm. Also, opportunities should be sought to deliver environmental benefits.

National Planning Policy Framework (NPPF)

8.2.15 The National Planning Policy Framework (NPPF) 2012 sets out government's planning policies for England and how these are expected to be applied. Chapter 11, 'Conserving and enhancing the natural environment', sets out the Government's policies on biodiversity. In summary, with regards to ecology and biodiversity, the NPPF requires that the planning system and planning policies should:

[2] Department for Transport (December 2014) *National Policy Statement for National Networks*: Presented to Parliament pursuant to Section 9(8) and Section 5(4) of the Planning Act 2008. Available from: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/387222/npsnn-print.pdf

- Minimise impacts on biodiversity and provide net gains in biodiversity where possible,
- Recognise the wider benefits of ecosystem services,
- Explore and encourage opportunities to incorporate biodiversity in and around developments,
- Refuse planning permission if significant harm cannot be avoided, adequately mitigated, or, as a last resort, compensated for,
- Not normally lead to a consent where the proposed development on land within or outside a Site of Special Scientific Interest (SSSI) would be likely to have an adverse effect on the SSSI (either individually or in combination with other developments).
- Lead to a refusal of planning permission if development will result 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.

8.2.16 The key principles of the NPFF have been considered in the preparation of this ecological assessment.

Highways England Biodiversity Plan

8.2.17 The Highways England (HE) biodiversity plan contains five specific outcomes, with a series of related actions. These outcomes will provide the most support for biodiversity across the network and will enable HE to meet the Road Investment Strategy requirements:

- Outcome 1: HE and its suppliers are equipped to produce good biodiversity performance.
- Outcome 2: The Strategic Road Network is managed to support biodiversity.
- Outcome 3: Deliver biodiversity enhancements whilst implementing a capital programme of network improvement.
- Outcome 4: The legacy of biodiversity problems on the network has been addressed via a targeted programme of investment.
- Outcome 5: HE are fully transparent about its biodiversity performance.

UK Post - 2010 Biodiversity Framework

8.2.18 Following the Convention on Biological Diversity (CBD) in 1992, the UK Biodiversity Action Plan (UK BAP) was published. The UK BAP described the biological resources of the UK and provided action plans for the most threatened species and habitats aid recovery. Local BAPs were also produced to identify local priorities, which often reflected regional and national priorities, and prescribed actions to be undertaken in order to maintain, restore and create habitats and conserve species.

8.2.19 The UK Post - 2010 Biodiversity Framework covers the period 2011 - 2020 and replaces the UK Biodiversity Action Plan (UKBAP) 1994 – 2010. It forms a strategy with the aim to address the underlying causes of biodiversity loss and improve and enhance biodiversity and ecosystem services. The Biodiversity Strategy for England[3] provides an overall picture of how England is implementing its international and EU commitments, and outlines the strategic direction for biodiversity policy for the next decade.

The National Pollinator Strategy: for bees and other pollinators in England

8.2.20 The Strategy[4] identifies the pressures faced by pollinators, including habitat loss, competition from invasive species, and climate change. Identified outcomes include more high quality flower rich habitats. Priority actions have been identified for large scale land managers to commit to specific actions to support pollinators on their land.

Regional and County Policy

Kent Biodiversity Strategy

8.2.21 The Kent Nature Partnership has identified priorities for the natural environment and ensures that work undertaken to contribute to the delivery of the objectives are reported, capturing the contribution made in Kent to the England Biodiversity Strategy.

Kent Biodiversity Action Plan

8.2.22 The Kent Biodiversity Action Plan (BAP) seeks to be proactive and sets out targets to achieve safeguards for biodiversity. Habitat and Species Action Plans have been produced which identify what needs to be done to enhance and restore habitats and reverse declines of species populations.

Local Policy

8.2.23 The new Local Plan to 2030 is currently being prepared by Ashford Borough Council (ABC) to apply the NPPF policies locally. The current local planning policy context is therefore set within Ashford's Core Strategy[5], which sets out the overall vision and objectives for the delivery of Ashford's Local Development Framework (LDF) between 2006 and 2021. Relevant policies to both the Main and Alternative Schemes include:

- **EN29 Nature Conservation Sites**: Development likely to adversely affect the integrity of a Ramsar or designated or potential / candidate Special Protection Areas and Special Areas of Conservation will not be

[3] Biodiversity 2020: A strategy for England's wildlife and ecosystem services', Defra, 2013

[4] Defra (2014) The National Pollinator Strategy: for bees and other pollinators in England. Available from: www.gov.uk/government/publications.

[5] Ashford Borough Council (2008) Local Development Framework Core Strategy

permitted unless there is no alternative solution and if there are imperative reasons of overriding public interest.

- **EN30: Nature Conservation Sites**: Development which would harm the value of Local Nature Reserves or Sites of Nature Conservation Interest will not normally be permitted.
- **EN31 Important Habitats**: Development which is likely to significantly affect semi-natural habitats/ important habitats will not be permitted unless:

  (a) Measures have been taken to limit significantly this impact; and,

  (b) Long term habitat protection is provided where appropriate.
- **EN32 Important Trees and Woodland**: Planning permission will not be granted for any development proposals which would damage or result in the loss of important trees or woodlands.
- **EN13 Green Corridors**: The Council will protect and enhance the "green corridors" in Ashford… Any development should not damage the "green corridor" environment.
- **EN14 Land Adjoining Green Corridors**: Development proposals on land adjoining the "green corridors" in Ashford will be permitted, provided they also make a positive contribution to the function and amenity value of these corridors.
- **CS11 Biodiversity and Geological Conservation**: Development should avoid harm to biodiversity conservation, and seek to maintain, enhance and expand biodiversity by restoring or creating suitable semi-natural habitats and ecological networks to sustain wildlife. In exceptional circumstances, development may be permitted provided appropriate mitigation or compensation measures are undertaken.

Urban Sites and Infrastructure Development Plan Document 2012

8.2.24 The Urban Sites and Infrastructure Development Plan Document (DPD) was adopted in October 2012[6], and forms part of the Ashford LDF. Policies most relevant to both the Main and Alternative Schemes include the following:

- Policy U19: Sevington. Specifically identified the need for redevelopment of the area and the delivery of the Main and Alternative Schemes, with the incorporation of landscaping for the site boundaries and within the site.
- Policy U21: Green Corridors. Concerned with the protection and enhancement of Ashford's Green Corridors. Developments must demonstrate that proposals will not harm the overall environment, biodiversity, visual amenity or functioning of the Green Corridor.

[6] Ashford Borough Council (2012) The Urban Sites and Infrastructure DPD

Ashford Green & Blue Grid Strategy

8.2.25 The Green and Blue Grid strategy[7] provides a background document within the LDF in relation to Green and Blue infrastructure, to illustrate how the open space network can be designed and managed to reflect local landscape and urban character by linking existing habitat patches.

8.3 Method of Assessment

8.3.1 The ecological receptors relevant to the Main and Alternative Schemes were identified in the Scoping Report[8], and are detailed below. The ecological receptors are natural resources that have the potential to be associated with significant effects[9]. This process requires the identification and selection of nature conservation resources, based on value and potential for significant negative effects.

Study Area

8.3.2 The study area comprises the Zone of Influence (ZoI) within which any ecological features that occur and have the potential to be affected by the development are considered. The potential ZoI[10] is considered to be:

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

8.3.3 The ZoI for each ecological receptor is variable, as the geographic area depends on the ecological attributes of the different ecological receptors.

8.3.4 The study area for each ecological receptor, as identified in the Scoping Report[11] was determined on the basis of both the Main and Alternative Scheme footprints, ecological characteristics of the receptor, and the connective habitat available. The approximate extents are summarised in Table 8.1 below.

[7] Sheils Flynn (2008) Ashford Green & Blue Grid Strategy. Ashford Borough Council.

[8] Mott MacDonald (January 2015) M20 Junction 10a Environmental Scoping Report 341755-90-140-RE-02 Rev D

[9] Highways England Interim Advice Note 130/10 Ecology and Nature Conservation: Criteria for Impact Assessment

[10] Institute of Ecology and Environmental Management (IEEM) (2006) Guidelines for Ecological Impact Assessment in the UK.

[11] Mott MacDonald (2015) M20 Junction 10aEnvironmental Scoping Report 341755-90-140-RE-02 Rev D January 2015

Table 8.1 Extents of the study areas for surveys of the ecological receptors

Ecological Receptor Surveys	Study Area
Phase 1 Habitat and site assessment	Main and Alternative Scheme boundary plus a zone of approximately 250m.
Invasive species	Main and Alternative Scheme footprints plus a zone of approximately 100m
Hedgerow Regulations Assessment	Main and Alternative Scheme footprints plus a zone of approximately 100m
Dormouse	Main and Alternative Scheme footprints plus a zone of approximately 250m.
Badger	Main and Alternative Scheme footprints plus a zone of approximately 250m.
Bats Buildings with roost potential Trees with roost potential	Main and Alternative Scheme footprints plus a buffer zone of a minimum 100m.
Bat activity	Main and Alternative Scheme footprints plus a zone of approximately 250m.
Breeding and wintering birds (including kingfisher and barn owl)	Main and Alternative Scheme footprints plus a zone of up to 100m.
Otter and water vole	Aylesford Stream corridor
White clawed crayfish	Aylesford Stream corridor
River habitat/ corridor survey of Aylesford Stream	Aylesford Steam corridor
Reptile	Main and Alternative Scheme footprints plus a zone of approximately 250m.
Great crested newt	Main and Alternative Scheme footprints plus a buffer zone of approximately 500m where access is permitted and where the ponds are connected to the Main and Alternative Scheme footprints.

8.3.5 The methodology for each of the surveys is outlined in the Extended Phase 1 Report Appendix 8.1, Volume 6.3, the Hedgerow Report Appendix 8.2, Volume 6.3, and the Protected Species Reports Appendix 8.3 – Appendix 8.10, Volume 6.3.

Receptors scoped out of assessment

8.3.6 A range of potential receptors were scoped out of baseline surveys. This included fish, as although a record of a European eel *Anguilla anguilla* and a bullhead *Cottus gobio* in the Aylesford Stream was produced during previous white-clawed crayfish surveys, presence of fish has been assumed. Any working methods in the construction and operational phases for both the Main and Alternative Schemes would need to consider aquatic fauna and flora, and comply with current regulations to prevent pollution of the Stream.

8.3.7 Habitats within the Scheme boundary are also considered to support habitat suitable for invertebrate groups including butterfly and moth *Lepidoptera*, ants, bees and wasps *Hymenoptera*, flies *Diptera*, spiders *Araneae* and dragonflies *Ordonata.* However, the habitats present are not considered a scarce habitat resource within the wider area for invertebrates so these taxa were not surveyed.

8.3.8 Other species not specifically protected under conservation legislation (see Section 8.2) and of negligible value would need to be considered in the CEMP for animal welfare reasons.

Significance Criteria

8.3.9 The surveys and assessment have been undertaken in line with DMRB and guidelines[12] [13] which are similar to best practice guidelines advocated by the Chartered Institute of Ecology and Environmental Management (CIEEM)[14].

8.3.10 The assessment process requires ecological receptors to be valued using both professional judgment, based on available guidance and information, together with advice from experts who know the area in which the study area sits, and information on the distribution and status of the features that are being considered. In accordance with these guidelines, the significance of effect on an ecological receptor is arrived at by considering the environmental sensitivity or value of the receptor or resource and the magnitude of impact.

8.3.11 The DMRB[15][16] guidelines recommend that the determination of the value of the ecological receptors is based on a geographic frame of reference, as shown in Table 8.2.

Table 8.2 Typical descriptors of environmental value or sensitivity

International or European - Very high
Very high importance and rarity, international scale and very limited potential for substitution. Includes: • Ramsar and European designated sites, or sites that meet the published selection criteria but not designated as such. • Sites with resident or regularly occurring population/s of species at International or European level where loss would affect the conservation status or distribution at this geographic scale, or where the population forms a critical part of a wider population at this scale, or is at a critical phase of its life cycle at this scale.
UK or National - High
High importance and rarity, national scale, and limited potential for substitution. Includes: • Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and sites that meet

[12] Highways England. Design Manual for Roads and Bridges (DMRB), Volume 10 Environmental Design. HMSO, London.

[13] Highways England. Design Manual for Roads and Bridges (DMRB), Volume 11 Environmental Assessment, Section 3 Chapter 7, parts 7.9-7.19 HMSO, London.

[14] Institute of Ecology and Environmental Management (IEEM) (2006) Guidelines for Ecological Impact Assessment in the UK.

[15] Highways England Interim Advice Note 130/10 Ecology and Nature Conservation: Criteria for Impact Assessment

[16] Highways England. Design Manual for Roads and Bridges (DMRB), Volume 11 Environmental Assessment, Section 2 Part 5 HMSO, London.

published criteria for selection. • Key / priority habitats. • Sites with resident or regularly occurring population of species at International, European, UK or National level where loss would affect the conservation status or distribution at this geographic scale. • Where the population forms a critical part of a wider population at this scale, or is at a critical phase of its life cycle at this scale.
Regional (England) – High / Medium
High or medium importance and rarity, regional scale, limited potential for substitution. Includes: • Key / priority habitats identified in the Natural Area Profile or Highways Biodiversity Action Plan; • Resident or regularly occurring populations of species which may be considered at an International, European, UK, National levels, or key / priority species where loss of these species would affect the conservation status or distribution at this geographic scale, or the population forms a critical part of a wider population at this scale, or is at a critical phase of its life cycle at this scale.
County (Kent) and District (Ashford) - Medium
High or medium importance and rarity, regional scale, limited potential for substitution. Includes • Sites of Nature Conservation Importance (SNCIs); County Wildlife Sites (CWSs); and Local Nature Reserves (LNRs) designated in the county or unitary authority area context. • Key habitats identified in the Local Biodiversity Action Plan or Natural Area profile. • Resident or regularly occurring populations of species which may be considered at an International, European, UK or National level where loss would affect the conservation status or distribution at this geographic scale, or the population forms a critical part of a wider population at this scale, or is at a critical phase of its life cycle at this scale.
Local (Site only) - Low
Medium importance and rarity, regional scale, limited potential for substitution. Includes • Local Nature Reserves (LNRs) designated in the local context. • Trees that are protected by Tree Preservation Orders (TPOs). • Areas of habitat; or populations/ communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees), including features of value for migration, dispersal or genetic exchange.
Local (Site only) – Negligible
Sites of low or very low importance, rarity and local scale.

8.3.12 Where a nature conservation resource has value at more than one level, its overriding value is that of the highest level. Effects on conservation status were only assessed in detail for features of sufficient value (local or above) that impacts upon them may be material in decision-making in terms of legislation or policy. Effects on features below local value would be categorised as of neutral significance.

8.3.13 In order to describe changes or activities and impacts on the features, the following parameters are used:

- Magnitude – if an impact is deemed to be significant then its magnitude, in quantitative terms, should be assessed.
- Extent – the area over which an impact occurs.
- Duration – the time for which an impact is expected to last; Effects are described as short, medium or long-term and permanent or temporary.

- Reversibility – a permanent impact is one that is irreversible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it; a temporary impact is one from which a spontaneous recovery is possible.
- Timing and frequency – whether impacts occur during critical life stages or seasons.
- Direct and Indirect Ecological Impacts.
- In this assessment, a direct impact is attributable to a defined action such as the physical loss of a habitat or the immediate mortality of an individual of a particular species.
- Indirect impacts are attributable to an action, which affects ecological resources through effects on an intermediary ecosystem, process or receptor. An example of an indirect effect would be the change in a plant community following changes to local hydrological conditions which are directly attributable to a development. Probability is described under Table 8.4 using standard CIEEM guidance.

8.3.14 The magnitude of impact is the degree of change on an ecological receptor. The descriptions for assigning the magnitude of impact to the receptors is based on the DMRB criteria[17] defined in Table 8.3 below. The impacts may be adverse or beneficial to the receptor.

Table 8.3 Criteria for Determining the Magnitude of Impacts

Magnitude	Criteria
Major Adverse / Beneficial	• Loss of resource and / or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse). • Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).
Moderate Adverse / Beneficial	• Loss of resource, but not adversely affecting the integrity; partial loss of / damage to key characteristics, features or elements (Adverse). • Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Minor Adverse / Beneficial	• Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, 1 (maybe more) key characteristics, features or elements (Adverse). • Minor benefit to, or addition of, 1 (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Negligible	• Very minor loss or detrimental alteration to 1 or more characteristics, features or elements (Adverse). • Very minor benefit to or positive addition of 1 or more characteristics, features or elements (Beneficial).
No impact (Neutral)	No loss or alteration of characteristics, features or elements; no observable impact

[17] Highways England. Design Manual for Roads and Bridges (DMRB), Volume 11 Environmental Assessment, Section 2 Part 5 HMSO, London.

Magnitude	Criteria
	in either direction.

Assessment of Significance

8.3.15 Using the combination of the conservation value of the receptor, and the magnitude of change and by following the methodology set out within the IAN 130/10 the significance of the effect can be assigned, as outlined within the matrix shown in Table 8.4 below. The significance of effect is assigned after allowing for the positive contribution of all mitigation that will be delivered.

Table 8.4 Determining the significance of effect categories

Environmental Value (Sensitivity)	Magnitude of Effect (Degree of Change)				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very large
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

8.3.16 For the purposes of this Environmental Impact Assessment (EIA) an effect is considered to be significant if it is moderate or greater.

8.3.17 Confidence in predictions to consider likelihood that the change will occur have been described in accordance with CIEEM guidelines[18], as a qualitative methodology is not provided by the DMRB. The 4 point scale is described as follows:

- Certain / Near-Certain: Probability estimated at 95% chance or higher.
- Probable: Probability estimated above 50% but below 95%.
- Unlikely: Probability above 5% but less than 50%.
- Extremely Unlikely: Probability estimated at less than 5%.

8.3.18 Changes may be described in regard to a number of parameters: positive or negative; magnitude, extent, duration, reversibility, timing and frequency.

[18] CIEEM (2006) Guidelines For Ecological Impact Assessment In The United Kingdom

8.4 Consultation

8.4.1 Consultation has been undertaken with statutory and non-statutory organisations to identify baseline information and, where appropriate, discuss likely effects, appropriate survey effort and the environmental (ecological) design for both the Main and Alternative Schemes. Organisations that have been contacted and invited to discuss the Main and Alternative Schemes include:

- Natural England (NE).
- Kent County Council (KCC).
- ABC.
- Environment Agency.
- Kent and Medway Biological Records Centre.
- Kentish Stour Countryside Project (KSCP).
- Kent Wildlife Trust (KWT).
- Kent Reptile and Amphibian Group.
- East Kent Badger Group (EKBG).
- Kent Bat Group.
- Kent Mammal Group.

8.4.2 Separate meetings have been held with KWT, KSCP and EKBG on 13 January 2016 to discuss the Main Scheme and to outline the ecological mitigation proposals. A further meeting was held with Kent Bat Group on 16 March 2016, where the Main and Alternative Schemes were discussed. A meeting with NE was held on 20 April 2016. The construction strategy had not been confirmed prior to the meetings with the local groups. The themes, consultee concerns and responses are outlined in Table 8.5.

Table 8.5 Summary of consultation themes

Consultee	Theme	HE Response / Action
NE	European Protected Species surveys and mitigation.	Habitat creation would provide a net benefit to species.
NE	Potential for dormouse population to be fragmented and isolated by the A2070 link road.	The habitat within the area that would be isolated by the Link Road is not suitable for a viable population of dormice. The mitigation proposed would safeguard individuals during construction, and would provide alternative and better habitat for dormice in the long term.
KWT; KSCP	Extend the proposed habitat creation area and incorporate additional habitat opportunities.	Area of habitat creation has been extended and further habitat specifications included.
KSCP	Restoration of the Aylesford Stream to improve the ecological	Modifications to the Stream are beyond the

Consultee	Theme	HE Response / Action
	functionality.	scope of the Main Scheme.
KWT	Tree planting would have the potential to cause enrichment, reducing the species richness of the botanical assemblage within the proposed grassland habitats.	Tree planting is essential for habitat connectivity for species that require arboreal routes and habitats. However, additional grassland habitat creation has subsequently been incorporated.
KWT	Partial loss of Highfield Lane Roadside Nature Reserve.	Proposals to translocate habitat supplemented with planting to provide a greater extent in place of the small area of loss was accepted. However, the extent of species rich grassland has subsequently been reduced to provide more scrub habitat.
KSCP	Partial loss of Ashford Green Corridor LNR during construction works only.	Proposal to replace current bridge with a bridge that is suitable for disabled users was accepted. MMSJV confirmed there would be no loss of the children's play area.
KWT, EKBG, Kent Bat Group	Baseline surveys and provisions for safeguarding protected species were accepted, although it is for Natural England to comment.	None required
KWT; KSCP	Habitat management.	Landscape objectives have been provided for long -erm habitat management actions to be determined in order to achieve the objectives.

8.5 Assumptions and Limitations

8.5.1 Field surveys were confined to locations where landowner permission had been obtained and any pertinent constraints or limitations to the surveys are outlined in the Appendices 8.1, 8.2 and 8.3, Volume 6.3. It should be noted however that the absence of protected or rare species does not preclude their presence on a site. There is always the risk of protected or rare species being overlooked, owing to the timing of the survey, scarcity of the species at the site, or changes over time or in habitat management.

8.6 Baseline Information

8.6.1 Surveys and assessment undertaken for the Main Scheme are considered suitable in application to the Alternative Scheme. A number of standard methods were followed to allow an evaluation of the baseline conditions within the study area. These included:

- A desk top study.
- An extended Phase 1 Habitat Survey (Appendix 8.1, Volume 6.3), including a combined River Corridor and River Habitat Survey Preliminary Assessments.
- Hedgerow Regulations Assessment (Appendix 8.2, Volume 6.3).
- Specific surveys for protected species, namely badgers *Meles meles*, bats, birds, dormice *Muscardinus avellanarius*, great crested newts

Triturus cristatus, reptiles, water voles *Arvicola amphibious* and otter *Lutra lutra*, and white clawed crayfish *Austropotamobius pallipes* (Appendix 8.3 – 8.10, Volume 6.3).

- Brown hare *Lepus europaeus* were not specifically surveyed, but have been considered due to feedback from NE during historic consultation.
- An Assessment of Implications on European Sites Habitats Regulation Assessment (AIES) (DCO submission document number 6.6).

8.6.2 Other species that were looked for (but not specifically surveyed) included other amphibians (common toad *Bufo bufo*, common frog *Rana temporaria*, smooth palmate newts *Lissotriton vulgaris* and *Lissotriton helveticus*); hedgehog *Erinaceus europaeus* and *Ovison vison*. Where the value of these species is considered only to be site level, a detailed impact assessment has not been undertaken. However, the CEMP and protected species mitigation strategies must consider species where presence on-site has been confirmed and where there is potential for them to be affected by both the Main and Alternative Schemes implementation of any mitigation measures.

Desk Study

8.6.3 A desk study was undertaken by searching available publications, reports and online databases from Multi-Agency Geographic Information for the Countryside (MAGIC, Joint Nature Conservation Committee (JNCC), and Natural England (NE)). Records of protected, notable and invasive species, as well as information on statutory and non-statutory designated sites, were obtained from Kent and Medway Biological Records Centre (KMBRC). Data from the Highways England Environmental Information System (EnvIS) has also been considered.

8.6.4 Along with ecological surveys undertaken and published in support of the SELEP Scheme[19], records were acquired for a 2km radius. Those dated within the last 10 years were considered relevant for this assessment. The results of the desk study are detailed in Appendix 8.1 and Appendix 8.3, Volume 6.3. Data from these reports is important as they provide historical data and include areas that were not accessible for ecological survey works as part of this study. Statutory and non-statutory organisations have also been consulted with.

Field surveys

8.6.5 Based on the desk study and previous surveys undertaken to date, a range of sensitive receptors were identified, including designated sites, habitats, and protected and notable species. Surveys were carried out in 2015 and 2016 to establish an accurate baseline to inform a robust impact assessment. Surveys to inform the EIA were focussed on features that were considered to be of at

[19] Mott MacDonald (March 2015) M20 Junction 10a Extended Phase 1 Habitat Report 341755-09-300-RE-001. An explanation of the SELEP Scheme is provided in Chapter 3 Consideration of Alternatives, Volume 6.1.

least local nature conservation value following the Scoping Report, or where information was required to ensure compliance with protected species legislation. The results of the various field surveys undertaken are summarised in this chapter, further details of the survey methodologies, habitats and species present within the study area can be found the Extended Phase 1 Report (Appendix 8.1, Volume 6.3), and the Protected Species Reports (Appendix 8.3 – Appendix 8.10, Volume 6.3) and the Confidential Badger Report.

8.6.6 The results of the desk study and field surveys undertaken are summarised below.

Designated sites

8.6.7 The key designated sites (identified in Figure 2.3 contained within Volume 6.2) are described in Table 8.6.

Table 8.6 Designated sites and description of attributes

Designated Site Name	Description
Hatch Park / Bockhanger Wood SSSI. Both the Main and Alternative Schemes are located 40m west of Hatch Park SSSI.	Hatch Park SSSI comprises unimproved acidic grassland and ancient pollard woodlands habitats, the latter of which supports an epiphytic lichen community. The woodland habitat is of importance for a variety of species, including beetles and hole-nesting birds, such as nuthatch *Sitta europaea*, stock dove *Columba oenas* and three woodpecker species. The SSSI is designated for its acidic grassland and woodland habitat.
Ashford Green Corridor Local Nature Reserve LNR. Partially within the Scheme boundary.	Comprises parkland and green space alongside the River Stour. The network of habitats is of importance for water voles, bats and kingfishers *Alcedo atthis*. The designation also recognises the wet grassland habitat which supports a diverse variety of plants and invertebrates.
Willesborough Lees and Flowergarden Wood SNCI. The Main Scheme and Alternative Scheme are located 600m south of Willesborough and Flowergarden Wood SNCI.	Willesborough and Flowergarden Wood SNCI comprises a diverse range of habitats, including wetland, rough grassland, scrub and woodland. The site supports breeding warblers such as nightingale *Luscinia megarhynchos*. The designation also recognises the importance of a range of flora that the site supports, including mosses, liverworts and white sedge, which has only been recorded at 2 other sites in Kent.
Great Stour Ashford to Fordwich SNCI. The Main Scheme and Alternative Scheme are located 2km east of Great Stour Ashford to Fordwich SNCI.	Great Stour Ashford to Fordwich SNCI is designated as a Local Wildlife Site throughout much of its length. The river is recognised for the diverse range of habitat it comprises. The sites importance for birds, invertebrates and water voles is also noted as a qualifying feature.
South Willesborough Dykes SNCI The Main Scheme and Alternative Scheme are located 2km north west of South Willesborough SNCI.	South Willesborough SNCI is recognised for its geological importance. The site also supports a diverse range of neutral and wet grassland species.

Designated Site Name	Description
Woods near Brabourne SNCI. The Main Scheme and Alternative Scheme are located 2km south east of Woods near Brabourne SNCI.	Woods near Brabourne SNCI is recognised for its woodland habitat which provides habitat for a variety of species.
Highfield Lane / Kingsford Street Junction Roadside Nature Reserve (RNR). Partially within the Scheme boundary.	Highfield Lane RNR is designated as an area of ecological value under the Kent Road Verge Project. The site supports a diverse range of plant species, such as common broomrape *Orobanche minor*, wild marjoram *Origanum vulgare* and great knapweed *Centaurea scabiosa*. This habitat is of importance for gatekeeper *Pyronia tithonis*, essex skipper *Thymelicus lineola* and common blue *Polyammatus icarus*.

8.6.8 As part of an Assessment of Implication on European Sites (AIES)[20], a desk study search was also undertaken for:

- European Sites within 2km of both the Main and Alternative Schemes.
- European Sites where bats are 1 of the qualifying interests within 30km of both the Main and Alternative Schemes.
- European Sites crossing, adjacent to, or upstream or downstream of both the Main and Alternative Schemes.

8.6.9 Both the Main and Alternative Schemes were assessed alone and in combination with other projects and plans to determine whether there would be any negative effects on the integrity of the Sites. Following the assessment, it was concluded that the Main and Alternative Schemes are not likely to result in effects on the integrity of European sites either alone or in-combination with other plans and projects, and an Appropriate Assessment was not considered necessary. Further information can be found in the Assessment of Implications on European Sites, Habitats Regulations Assessment (DCO submission document number 6.6).

Habitats

8.6.10 The site was visited on the 24 November 2014 by 2 Mott MacDonald Sweco Joint Venture (MMSJV) Ecologists. A walkover of the area was undertaken to identify the presence of any ecologically valuable habitats with the potential to support protected and notable species.

8.6.11 Habitats within the study area were identified, classified and mapped in accordance with the Handbook for Phase 1 Habitat Survey[21]. Where possible, plant species were identified to species level. The Phase 1 Habitat map and accompanying target notes are provided in Appendix A and Appendix B of Appendix 8.1, Volume 6.3. The habitats identified are summarised in Table

[20] Mott MacDonald (March 2015) M20 Junction 10a Assessment of Implications on European Sites 341755-90-230-RE-001 Rev AB

[21] JNCC, (2010), Handbook for Phase 1 habitat survey - a technique for environmental audit, ISBN 0 86139 636 7

8.7 and are of relevance to both the Main Scheme and the Alternative Scheme.

Table 8.7 Habitats Descriptions

Site Name/Floral or Faunal Group	Description
Hedgerows	Three hedgerows qualify as 'Important' under the Hedgerow Regulations (1997). Eight species poor hedgerows were identified within the Study Area. There is 0.49 hectares (ha) of hedgerow habitat within the boundary of both the Main and Alternative Schemes. This represents 1% of the overall Scheme extent.
Running water	Aylesford Stream runs from Sevington to Ashford where it joins the River Stour and is approximately 5km in length. The Stream corridor includes mature, bank side trees that over shadow the stream, and ground vegetation dominated by common nettle, bramble and cleavers. There is 0.3ha of running water habitat within the boundary of both the Main and Alternative Schemes. This represents 1% of the overall extent.
Standing Water and Reed-bed	An area of reed swamp was recorded adjacent to the derelict garden nursery. This habitat was principally dominated by common reedmace *Thypha latifolia*, common reed *Phragmites australis* and great willowherb *Epilobium hirsutum*. There is 0.48ha of reed swamp within the boundary of both the Main and Alternative Schemes. This represents 1% of the overall extent.
Ponds	24 ponds were identified within 500m of the surveyed area.
Wet Ditch	One ditch measuring approximately 1m wide with a depth of 0.5m was identified towards the northern boundary within an arable field. This was bordered by scattered scrub dominated by blackthorn *Prunus spinosa*. One ditch was located to the south of the M20 balancing pond.
Arable	Arable was the dominant habitat within the surveyed area. The fields were subject to a regular management regime and had few field margins. There are 13.5ha of arable fields within the boundary of both the Main and Alternative Schemes. This represents 39% of the overall extent.
Scattered trees	Scattered trees were identified throughout the surveyed area. 62 individual trees and 29 groups of trees were recorded. The majority of trees were part of the existing highway planting scheme. Typically these groups were semi-mature and made up of mixed native species, including hawthorn *Crataegus monogyna*, field maple *Acer campestre*, wild cherry *Prunus avium*, oak *Quercus robur* and ash *Fraxinus excelsior*. A large proportion of trees were situated within linear groups demarking field and/or property boundaries. These groups were typically early mature to mature and were made up of a mix of species, including hawthorn, goat willow *Salix caprea*, elder *Sambucus nigra* and hazel *Corylus avellana*. There is 0.53ha of scattered trees within the boundary of both the Main and Alternative Schemes.

Site Name/Floral or Faunal Group	Description
	This represents 1% of the overall extent.
Poor semi-improved neutral grassland	Poor semi-improved neutral grassland was identified on the western boundary situated between St Marys Church and the arable fields. The habitat is principally dominated by cock's foot *Dactylis glomerata*, common bent *Agrostis capillaris*, crested dog's tail *Cynosurus cristatus*, common ragwort *Senecio jacobaea* and rosebay willowherb *Chamerion angustfolium*. There are 4.8ha of semi-improved neutral grassland within the boundary of both the Main and Alternative Schemes. This represents 14% of the overall extent.
Improved Grassland	Areas of improved grassland were identified towards the northern boundary and intersecting arable fields. There is 1ha of improved grassland within the boundary of both the Main and Alternative Schemes. This represents 2% of the overall extent.
Amenity Grassland	Areas of intensively managed amenity grassland were recorded surrounding residential and commercial properties throughout the surveyed area.
Scrub	Scattered scrub was common throughout the surveyed area, principally recorded on roadside verges and adjacent to watercourses. This habitat was dominated by hawthorn, bramble *Rubus fruticosus* and blackthorn. There is 0.59 ha of scrub within the boundary of both the Main and Alternative Schemes. This represents 1% of the overall extent.
Tall ruderal	Areas of tall ruderal vegetation were identified within the derelict garden nursery towards the northern boundary, along boundary features and fence lines. There are 4.1ha of tall ruderal habitat within the boundary of both the Main and Alternative Schemes. This represents 12% of the overall extent.
Broadleaved and Mixed Plantation Woodland	Woodland of this type occurred immediately adjacent to the M20 on the northern boundary and was connected to surrounding hedgerows. Species recorded included hazel, sycamore *Acer pseudoplatanus*, ash, and field maple, with a hawthorn understory (TN21). Additionally, there were several stands of Scots pine *Pinus sylvestris*. Ground flora included nettle, although little understory was evident at the time of the survey. Additional areas of woodland were identified from aerial photography on the central reservation; north of the M20 and Hythe Road, however due to access constraints it was not possible to survey these areas. There is 0.9ha of plantation woodland within the boundary of both the Main and Alternative Schemes. This represents 2% of the overall extent.
Broadleaved Semi-Natural Woodland	Areas of broad-leaved semi-natural woodland were identified throughout the surveyed area. This habitat was principally dominated by ash, hazel and field maple. There are 7.4ha of this habitat type within the boundary of both the Main and Alternative Schemes. This represents 22% of the overall extent.

Protected species

8.6.12 Phase II ecological surveys were undertaken over the course of 2015 to gather baseline data. The results of the surveys are detailed in the Appendix 8.1 – Appendix 8.9, Volume 6.3 and summarised below. These results are of relevance to both the Main and the Alternative Schemes.

Badgers

8.6.13 Updated surveys carried out by MMSJV in January 2015 confirmed an active badger sett within both the Main and Alternative Scheme footprints due to evidence of bedding material outside 1 of the entrance holes. Four setts were identified during the initial walkover, [redacted]. Of the 3 within the Scheme, 1 sett was considered active. Badger foraging surveys indicated that the badger territories do not currently overlap, although very little evidence of badger activity was found it did not provide a conclusive picture of their territories.

8.6.14 Infra-red, motion sensor camera surveys were undertaken at the active sett during the Summer of 2015. One sequence was captured of a badger emerging and re-entering 1 of 2 potentially active entrance holes, and very few field signs of badger were seen throughout the Summer season. Following other surveys on site, new badger activity was noted in autumn 2015, and the cameras were reinstalled along with adhesive hair traps. Findings indicated current use of the sett by a small clan.

8.6.15 Camera traps were redeployed from January until June 2016 which captured badger activity on a very occasional basis only, with no evidence found of a preferred entrance hole or regular use. This pattern of behaviours reinforced the survey findings in 2015 indication that Sett A is mostly utilised over winter and activity is likely to be attributed to a small clan.

8.6.16 Survey findings in 2015 – 2016 are indicative of badger activity for the purpose of a baseline assessment. However, due to the intermittent and low levels of activity, it is difficult to define the sett status within the usual parameters of classification[22] . None of the sett entrances have conspicuously large spoil heaps; the sett is not continuously active; and there are no obvious paths leading to a main sett [23]. Sett A is therefore considered to be a subsidiary sett that is used on a seasonal basis only. A summary of the status and activity identified at each sett is summarised in Table 8.8. Follow up surveys would be necessary to identify any changes in use, particularly in respect of Sett A.

[22] Andrews, R. (2013) 'Classification of badger setts *Meles meles* in the UK: A Review and Guidance for Surveyors', In Practice 82, page 27. Bulletin of the Chartered Institute of Ecology and Environmental Management

[23] Harris, S., Cresswell, W. and Jefferies, D. 1989. Surveying badgers. Mammal Society Occasional Publication No. 9. Mammal Society, London. Andrews, R. (2013) 'Classification of badger setts *Meles meles* in the UK: A Review and Guidance for Surveyors', In Practice 82, page 27. Bulletin of the Chartered Institute of Ecology and Environmental Management

Table 8.8 Summary of Setts

Sett name	Location	Entrance holes	Status
A	[redacted]	Two used entrances. Three partially used entrances. Six disused entrances. Numerous rabbit holes and small mammal holes.	Subsidiary
B	[redacted]	One well used entrance. One entrance in use by fox.	Outlier
C	[redacted]	Ten partially used mammal entrances.	Disused Subsidiary. Camera imagery (November 2015) captured rabbit activity only.
D	[redacted]	Three potential badger holes within a rabbit warren.	Unconfirmed as outside ZoI.

Bats

8.6.17 In 2015, habitat features were reassessed by MMSJV in order to determine whether any built structures or trees have potential to support bats. Buildings and trees considered to have potential were surveyed, along with the wider area to determine bat activity.

8.6.18 Bat activity (foraging and commuting) was noted at all the building locations with the majority of the bat passes being determined to be common pipistrelle *Pipistrellus pipistrellus* followed by soprano pipistrelle *Pipistrellus pygmaeus*, occasional calls from the genus Myotis, serotine *Eptesicus serotinus*, noctule N*yctalus noctula* and brown long-eared *Plecotus auritus* were also noted in low numbers. All bats were noted to be both commuting and foraging, no social calls were noted. Hot spots of bat activity were noted in the locality of St Mary's Church and Court Farm Complex in the west of the site and Lagonda Lodge and Redbur House and Annex in the east.

8.6.19 Confirmed bat roots were identified at St Marys Church and Redbur House (Appendix 8.3, Volume 6.3). The only emergence was confirmed at St Marys Church of a soprano pipistrelle on 7 September 2015. However, at numerous locations (Highfield Bungalow, St Marys Church, Court Farm Complex, Lagonda Lodge, Kennistone, and Redbur House and Annex) surveyors noted bats arriving at the buildings close to their expected emergence or re-entry times indicating there are roosts in close proximity to the survey area for common pipistrelle, soprano pipistrelle, brown long-eared, *Myotis* species, noctule and serotine. Bat droppings were also found at Redbur House during an internal inspection, but no emergences were recorded during the 2015 surveys so was classified as inactive.

8.6.20 No emergences or re-entries were confirmed during any of the tree dusk and pre-dawn surveys. However, a possible re-entry of a soprano pipistrelle was noted at 06:15 in the vicinity of T6, (a large willow tree located along the Aylesford Stream). On this occasion the bat was noted foraging towards T6 close to dawn on the 8 September 2015 and, although it was not seen to re-enter the tree, echolocation stopped abruptly.

8.6.21 At all of the 32 trees surveyed common pipistrelle foraging and commuting activity was noted. Myotis species were noted at 4 locations (Trees 1, 801, 829 and Aylesford Stream) and noctule foraging and commuting activity was noted at 5 locations (Tree 3, 808, 826, 829 and Aylesford Stream). Soprano pipistrelle activity was noted at all locations excluding trees 826 and 827. The areas with the highest density of activity were along Aylesford Stream and at either end of the tree line parallel to Aylesford Stream (adjacent to the A2070 and at the corner of the tree line near Tree 1). These same species were identified to be using the site for foraging and commuting during the transect surveys.

Birds (Breeding and wintering)

8.6.22 Breeding bird surveys were undertaken by MMSJV in 2015, comprising 3 visits. A total of 39 species were recorded, including:

- One species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (i.e. barn owl *Tyto alba*).
- Eight species are listed in Section 41 of the NERC Act 2006.
- Four species listed in the Kent Biodiversity Action Plan.
- No species recognised by the Rare Breeding Birds Panel (RBBP) were identified on Site.

8.6.23 'Birds of Conservation Concern', a *"measure…to convey concern and…help set priorities for conservation action*"[24], were recorded and include:

- Seven species are Red List Birds of Conservation Concern.
- Four species are Amber List Birds of Conservation Concern.
- Twenty seven species are Green List Birds of Conservation Concern.

8.6.24 None of the species recorded are Red or Amber List birds of conservation concern are considered to be range restricted but are common and widespread in England[25] and in Kent[26].

[24] Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove, A.J., Hearn, R., Aebischer, N.J., Gibbons, D.W., Evans, A. & Gregory, R.D., 2009. Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102, 296–341.

[25] Balmer, D., Gillings, S., Caffrey, B., Swann, B., Downie, I & Fuller, R., 2013. Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland. British Trust for Ornithology, Thetford.

[26] Kent Ornithological Society, 2015. New Breeding Atlas (2008-2011). [online] Available at: <http://www.kentos.org.uk/atlas/2008/index_c.shtml> [Accessed on 13 June 2016].

8.6.25 Noteworthy species that were recorded and considered to be probably breeding in low numbers included song thrush *Turdus philomelos*, dunnock *Prunella modularis*, skylark *Alauda arvensis*, bullfinch *Pyrrhula pyrrhula*, linnet *Carduelis cannabina* and house sparrow *Passer domesticus*.

8.6.26 Wintering bird surveys were also undertaken. Three survey visits were undertaken; the first visit in March 2015 and 2 further visits in November and December 2015. A total of 43 species were recorded, including 1 species listed on Annex 1 of the EU Birds Directive (i.e. kingfisher):

- Six species are listed in Section 41 of the NERC Act 2006.
- Three species listed in the Kent Biodiversity Action Plan

8.6.27 'Birds of Conservation Concern', a *"measure…to convey concern and…help set priorities for conservation action*" , were recorded and include:

- Eight species are Red List Birds of Conservation Concern
- Ten species are Amber List Birds of Conservation Concern.
- Twenty three species are Green List Birds of Conservation Concern.

8.6.28 None of the species recorded as Red or Amber List birds of conservation concern are considered to be range restricted but are common and widespread in England[27] and in Kent[28]. Refer to the bird survey report for further details (Appendix 8.4, Volume 6.3).

Dormouse

8.6.29 Dormouse surveys were undertaken by MMSJV in 2015 and confirmed presence of dormice. Nests and individuals were in the broadleaved semi-natural woodland and hedgerows in the vicinity of Kingsford Street and along the M20 Londonbound verge, and the mixed planation woodland along Church Road. Dormouse presence has also been assumed between the M20 and A20, and to the north of the A20, as access prevented sufficient survey effort to be undertaken to confirm presence / likely absence.

Great Crested Newt (GCN)

8.6.30 Pond surveys for great crested newts (GCN) undertaken between April and June 2008, confirmed a small population of GCN in a garden pond 120m south of both the Main and Alternative Schemes (refer to Figure 8.1, Volume 6.2). Surveys were then undertaken in 2012 as part of the SELEP scheme. Seven ponds were subject to Habitat Suitability Index assessments (HSI) and GCN surveys. Of these, GCN were confirmed as present at 2 of the ponds, (Ponds 20 and 21) with a peak count of 31 GCN giving a Population Size

[27] Balmer, D., Gillings, S., Caffrey, B., Swann, B., Downie, I & Fuller, R., 2013. Bird Atlas 2007-11: The Breeding and Wintering Birds of Britain and Ireland. British Trust for Ornithology, Thetford.

[28] Kent Ornithological Society, 2015. New Winter Atlas (2008-2011). [online] Available at: <http://www.kentos.org.uk/atlas/2007/index_c.shtml> [Accessed on 13 June 2016].

Class Assessment of 'medium'. The surveys were repeated in 2014, and recorded a 'small' population size class at Pond 20 only. No GCN were recorded at any of the other ponds. For the purposes of this report, a 'medium' size class is assumed as GCN do not breed every year, and no other explanation, such as habitat loss or a decline in quality, was provided. Refer to Figure 8.1, Volume 6.2 for pond locations.

8.6.31 In 2015, MMSJV undertook surveys of accessible and suitable ponds. Access was not permitted to the 2 ponds where GCN presence had previously been confirmed. No GCN were found in the ponds surveyed. However, due to the previous evidence, GCN are still considered to be an ecological receptor for both the Main and Alternative Schemes.

8.6.32 Other amphibians found during surveys included one toad *Bufo bufo* by the bank along Aylesford Stream and another toad along the M20 verge; and smooth *Lissotriton vulgaris* and palmate *Lissotriton helveticus* newts within Highfield Bungalow Pond, and Pond 2.

Reptiles

8.6.33 Field surveys undertaken in 2015 by MMSJV encountered slow-worm, common lizard and grass snake. The peak count of adult grass snakes was 2 individuals, which equates to a 'low' population[29]. As grass snakes range over large areas, it is likely that the individuals encountered in the survey use the site transiently for foraging and commuting. The peak count of adult slow-worm was 34, which equates to an 'exceptional' population and the peak count of common lizards was 23, which also equates to an 'exceptional' population.

8.6.34 As the site supports at least 3 reptile species including 'exceptional' populations of 2 species, it can be considered as a 'Key Reptile Site'[30].

Riparian Mammals (water vole and otter)

8.6.35 Surveys undertaken in 2010 and 2012 confirmed presence of water voles along the stretch of Aylesford Stream within the study area, with 10 water vole burrows and other field signs found along the bank. No evidence of otter has been recorded previously. However, a recent report[31] was made of an old otter spraint and fresh prints were found at Conningbrook in 2015, approximately 1.8km from the top of Aylesford Stream.

8.6.36 These surveys were updated in 2015 by MMSJV, with surveys undertaken in May and September. The survey in May identified 85 burrows; 28 latrines; feeding stations, and runs through the vegetation indicating activity at the time

[29] Froglife, 1999. Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

[30] Froglife, 1999. Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

[31] Kent Wildlife Trust (2015) Email

of the survey. A medium population was estimated, based on the evidence found. The survey in September did not change the population assessment.

8.6.37 A squashed, dead mink was found during other survey work on the A20.

8.6.38 Otter surveys were combined with the water vole surveys to identify any otter activity that may have been evident along the stretch of the Aylesford Stream within the Scheme boundary. No signs of otter were identified. The Aylesford Stream corridor was not considered suitable to provide a permanent site for a resident otter as the habitat is not of a sufficient extent to form a viable territory, and provide a sustainable source of prey items. However, due to aquatic and terrestrial connectivity to the Conningbrook Lakes there is potential for adhoc presence given the mobility of the species and their large territories, therefore the Stream may be used on a rare basis for foraging or commuting. Therefore, as a precaution, intermittent presence has been assumed as a possibility for the purpose of the assessment.

White clawed crayfish

8.6.39 Surveys undertaken in 2008, 2010 and by MMSJV in 2015 did not find any evidence of presence. No crayfish were recorded during the field surveys undertaken in 2015 and it is considered highly likely that they are absent. No survey constraints affected the surveys or the validity of the findings to confirm likely absence. Therefore, white clawed crayfish do not need to be considered as an ecological receptor as part of the Main and Alternative Schemes and have not been taken any further in this assessment.

Other Notable species

8.6.40 Historic consultation with NE confirmed that brown hare should be considered as a potential ecological receptor. Although no specific surveys were undertaken for brown hare, there were sufficient opportunities for adhoc sightings to have been made of their presence within the study area. No brown hare were recorded during any of the survey work and are not considered any further in this assessment

8.6.41 One dead hedgehog, listed under Schedule 41 of the NERC Act (2006) was found during the surveys, although no specific surveys were undertaken for the species. Common toad, also a Schedule 41 species, was encountered during reptile surveys. Mitigation for these species would be in accord with specific mitigation for other species, and as part of generic mitigation. This would include sensitive working methodologies that would be outlined in the CEMP. However, due to the status of the species at site level, these species have been scoped out of further assessment.

Summary

8.6.42 These findings provide a baseline of ecological features present. However, not all of the features would be considered to be Valued Ecological Receptors for the purpose of assessment due to the value that would be afforded following

the criteria described in Table 8.3, which is in accordance with the criteria detailed in the DMRB[32].

Assessment of Value of Ecological Receptors

8.6.43 Ecological features identified and described have been evaluated against the criteria described in Table 8.3.

Designated sites

8.6.44 Statutory and non-statutory designated sites of nature conservation importance occur within 2km of the Scheme boundary. The value of these sites is given in Table 8.9 below.

Table 8.9 Valuation of designated sites

Designated Site Name	Rationale	Value
Hatch Park / Bockhanger Wood SSSI	Hatch Park SSSI comprises important habitats which support a wide range of invertebrates and birds. The SSSI lies 40m north of the Scheme boundary.	High / National
Ashford Green Corridor LNR	Ashford Green Corridor LNR supports a network of habitats of importance for water voles, bats and kingfishers. The LNR lies partially within the DCO boundary.	Medium / County
Highfield Lane / Kingsford Street Junction RNR	Highfield Lane RNR is designated as an area of ecological value under the Kent Road Verge Project. The RNR lies partially within the Scheme boundary.	Low / Local

8.6.45 Other non-statutory designated sites were also identified within 2km of the Scheme boundary. However, as these sites were beyond 500m and are at negligible risk of being affected by the Main and Alternative Schemes, these sites have been scoped out from further assessment:

- Willesborough Lees and Flowergarden Wood SNCI (Medium / County).
- South Willesborough Dykes SNCI (Medium / County).
- Great Stour Ashford to Fordwich SNCI (Medium / County).
- Woods near Brabourne SNCI (Medium / County).

Habitats

8.6.46 Table 8.10 identifies the valuation assigned to habitats identified within the Scheme boundary. Ten habitats were considered to be Valued Ecological Receptors (VERs) and have therefore been taken forward in the assessment. Six features however, have not been taken forward for assessment as their VERs are considered low for the purposes of assessment:

- Wet ditch.

- Arable.
- Scattered trees.
- Improved grassland.
- Amenity grassland.
- Tall ruderal.

Table 8.10 Valuation of habitats

Site Name/Floral or Faunal Group	Description	Rationale	Value
Species-Rich or 'Important' Hedgerows (according to the Hedgerow Regulations 1997).	Three hedgerows qualify as 'Important' under the Hedgerow Regulations (1997).	Hedgerows are listed as a UK Priority Habitat (Section 41 NERC Act 2006), and are included on the Kent Biodiversity Action Plan. Loss of qualifying hedgerows would reduce the availability of this habitat type and affect the achievement of national targets. The hedgerows are subject to regular farm management and considered to be in a **Stable** condition.	High / National
Species-Poor Hedgerows.	Eight species poor hedgerows were identified within the Study Area.	These hedgerows provide ecosystem functions, such as wind breaks and connective habitat. However, they are of low ecological interest, supporting limited species assemblages and are set within or around arable fields of low ecological interest. The hedgerows are subject to regular farm management and considered to be in a **Stable** condition.	Medium / County
Running water / Aylesford Stream.	Aylesford Stream runs from Sevington to Ashford where it joins the River Stour and is approximately 5km in length. The Stream corridor includes mature, bank side trees that over shadow the stream, and ground vegetation dominated by common nettle, bramble and cleavers.	Streams are listed as a UK Priority Habitat (Section 41 NERC Act 2006) and are included on the Kent Biodiversity Action Plan. The Stream is rated as 'severely modified'. Due to lack of management, the floristic species assemblage is poor and likely to reduce further without intervention. Therefore the status of the habitats along the Stream corridor are considered to be in **Decline**.	Medium / County
Standing Water and Reed-bed.	An area of reed swamp was recorded adjacent to the derelict garden nursery. This habitat was principally dominated by common	Reed beds are listed as a UK Priority Habitat (Section 41 NERC Act 2006) and are included on the Kent Biodiversity Action Plan. However, reed- beds can easily be	Medium / County

Site Name/Floral or Faunal Group	Description	Rationale	Value
	reedmace, common reed and great willowherb.	replicated. Due to habitat succession, over shading and silt deposition, the status of the reed-bed is considered to be in **Decline**.	
Ponds	24 ponds were identified within 500m of the surveyed area.	Ponds are listed as a UK Priority Habitat (Section 41 NERC Act 2006) and are included on the Kent Biodiversity Action Plan. However, none of the ponds within both the Main and Alternative Scheme footprints meet the criteria to be classified as priority ponds. It is assumed that none of the ponds are subject to plans for any management intervention that would enable them to meet the criteria. The conservation status of these ponds is considered **Unfavourable** and **Stable**.	Medium / County
Scattered trees	Scattered trees were identified throughout the surveyed area. 62 individual trees and 29 groups of trees were recorded. The majority of trees were part of the existing highway planting scheme. Typically these groups were semi-mature and made up of mixed native species, including hawthorn, field maple, wild cherry oak and ash. A large proportion of trees were situated within linear groups demarking field and/or property boundaries. These groups were typically early mature to mature and were made up of a mix of species, including hawthorn, goat willow, elder and hazel.	None of the scattered trees are subject to tree preservation orders (TPOs). However, many of the trees provide valuable features for species of conservation interest. Without intervention, some of the trees will deteriorate and fail; these are unlikely to provide dead wood resource, and would need to be removed for the safety of pedestrians and for farmland management activities. Therefore the conservation status of the trees is considered **Favourable** and in **Decline**.	Low / Local
Poor semi-improved neutral grassland.	Poor semi-improved neutral grassland was identified on the western boundary situated between St Marys Church, Sevington and	Habitat is not subject to specific priority targets. However, the habitat supports protected species in combination with the mosaic of other habitats on site. The condition of the grassland	Low / Local

Site Name/Floral or Faunal Group	Description	Rationale	Value
	the arable fields. The habitat is principally dominated by cock's foot, common bent, crested dog's tail, common ragwort and rosebay willowherb.	was variable and dependent on the grazing pressure. It is assumed that a low intensity grazing regime would be maintained, therefore the condition status is considered **Favourable** and **Stable**.	
Scrub	Scattered scrub was common throughout the surveyed area, principally recorded on roadside verges and adjacent to watercourses. This habitat was dominated by hawthorn, bramble and blackthorn.	Habitat is not subject to specific priority targets, but the habitat may support protected species as part of a wider habitat mosaic. An on-going, and occasional management regime is assumed; the condition status is considered **Favourable** and **Stable**.	Low / Local
Broadleaved and Mixed Plantation Woodland.	Plantation woodland was recorded immediately adjacent to the M20 on the northern boundary. This habitat was principally dominated by hazel, sycamore, ash and field maple, with a hawthorn understory.	Woodland habitats are listed as a UK Priority Habitat (Section 41 NERC Act 2006) and Kent BAP broad and priority habitats. However, none of the woodland parcels within the Main and Alternative Scheme footprints are a BAP habitat. Therefore the conservation statuses of these are considered to be **Unfavourable** and **Stable**.	Low / Local
Broadleaved Semi-Natural Woodland	Areas of broad-leaved semi-natural woodland were identified throughout the surveyed area. This habitat was principally dominated by ash, hazel and field maple.	As above	Medium / County

Species

8.6.47 Following the surveys undertaken, the following species were scoped out of further assessment due to likely absence:

- Brown hare
- White-clawed crayfish.

8.6.48 Table 8.11 outlines the species considered to be VERs that have been taken forward in the assessment. Two species have been excluded from further consideration:

- Common toad (Low / Site value).
- Hedgehog (Low / Site Value).

8.6.49 Although they have not been assessed, generic mitigation would safeguard the welfare of any individuals present:

Table 8.11 Species Valuation

Site Name / Floral or Faunal Group	Rationale	Value
Badger	Badgers are categorised as a species of Least Conservation concern (IUCN) and are widespread in the UK. Loss of populations at this scale is unlikely to be critical to the conservation status of badger at County or higher levels	Low / Local
Bats	Species identified during surveys are all categorized as 'Least Concern' on the IUCN red list. Common and Soprano pipistrelles are listed as Kent BAP species. Loss of populations at this scale is unlikely to be critical to the conservation status of bats at regional or UK scale, but is likely to be significant at county level as a targeted Kent BAP species	Medium / County
Birds (breeding and wintering)	In terms of species richness the breeding bird and wintering bird community conservation importance of the Site has been classified as 'Local'. On the basis of the breeding bird community quality calculation the Site has been classified as being of 'County' importance. Therefore the higher value has been adopted.	Medium / County
Dormice	Dormice are of Least Concern (IUCN) but have been identified as a UK and Kent BAP priority species. Kent is a stronghold for dormouse, and will readily colonise connected and suitable habitat. Loss of population at site level is unlikely to affect conservation status of the species at county level or higher, given that the site is at the fringe of available habitat due to the existing urban environment and infrastructure that form barriers to connectivity.	Low / Local
Great Crested Newt	GCN are categorized as a species of Least Concern but are a UK and Kent BAP priority species. However, loss of this species would not affect the conservation status at county level or higher as both the Main and Alternative Schemes are at the edge of available terrestrial range due to the presence of highway and rail infrastructure on 3 sides, therefore absence of a resident population would not change the conservation status of the species at county or higher levels.	Medium / County
Reptiles (common lizard, slow worm, grass snake)	The 3 reptile species confirmed on site are categorised as being of Least Concern (IUCN) but are UK and Kent BAP priority species. Reptiles are widespread and abundant within wider surrounds, including the motorway verge, and likely to be present within other connected habitat within wider landscape. Therefore the resident population is considered to have local importance only.	Low / Local
Riparian Mammals	Water vole are categorised as being of least concern (IUCN), but is a UK priority species and a Kent BAP species. However, the resident population is part of a	Medium/ County

Site Name / Floral or Faunal Group	Rationale	Value
	watershed that forms one of the stronghold areas in Kent, although the resident population is considered to be at risk of decline. The Kent population of otter may be recovering, therefore due to the importance of all individual otter within the county and as otter have large territories, the value for otter is considered to be of Medium / County importance.	

8.7 Mitigation and Compensation Measures

8.7.1 Appendix 8.1 – Appendix 8.9, Volume 6.3 provide a detailed account of the mitigation measures to avoid or minimise impacts during both the construction and operational phases of both the Main and Alternative Schemes. However, a summary is provided below for each valued ecological receptor.

Main Scheme – Construction

8.7.2 The majority of potential impacts would arise during the construction phase. Where possible, potential impacts and risks to habitats have been considered at design stage and avoided or minimised. Impacts would be managed through standard mitigation measures, such as adherence to best practice and published guidance. These measures have been detailed in an Outline Construction Environmental Management Plan (CEMP) contained in Appendix 17.1, Volume 6.3, and include provisions for any European or UK Protected Species and associated specific mitigation strategies regarding habitats.

Designated sites

8.7.3 Construction activities would result in a slight increase in airborne pollutants however, the levels are considered to be imperceptible. Best practice measures would be applied during construction to minimise the air pollutants during works, as described in the Outline CEMP (Appendix 17.1, Volume 6.3).

8.7.4 The semi-improved grassland habitat within Highfield Lane RNR to be temporarily lost would be mitigated through the translocation of turf and soil, supplemented with seed planting using an appropriate mix of native species to species-rich grassland adjacent to the remaining RNR. The hedgerows would provide a wind break for invertebrates such as butterflies. Turf translocation is a tried and tested technique and is successful with the correct preparation, timing, and after care.

Habitats

8.7.5 The Main Scheme design has sought to avoid and minimise habitat loss where ever possible. This has included designing infrastructure features around key habitats to avoid loss; for example, by positioning the balancing ponds to maximise retention of mature trees. Mitigation during construction would include fencing in accordance with BSI 5837:2012 to protect trees that do not require removal. However, the Main Scheme would entail some land

take from semi natural habitats, and would cause damage to peripheral working areas, including for the provision of site compounds, material storage, access and haul routes. The locations of these provisions has avoided key habitat where possible, with specific mitigation recommended to maintain habitat functionality during works, i.e. fencing to prevent light intrusion or to provide cover against predators along skylines (e.g. Bats).

8.7.6 The ecological integrity of key habitats would also be enhanced in the short-term by undertaking targeted pruning, and tree felling, pollarding or coppicing in key areas. This would open up canopies to provide more sunshine to the ground level. Additionally, strimming vegetation to reduce the vigour of invasive species such as nettle and bramble would create opportunities for a wider botanical species assemblage to develop. Key areas outside the extent of the Main Scheme would also be enhanced to provide receptor sites for protected species that would require relocation.

8.7.7 Of the non–native, invasive species identified within the Main Scheme footprint, Japanese knotweed, would require a specific management plan and strict implementation to ensure the works do not cause the species to spread further. Control measures could include herbicide treatment and burial of the plant and infested soil in accordance with the Code of Practice, or excavation and removal as a controlled waste.

8.7.8 Water pollution prevention measures would be clearly identified in the CEMP, and works would be undertaken in accordance with CIRIA Guidelines. This would minimise risks of causing a pollution incident, reduce the severity of any such incident, and ensure that any resulting pollutant would be dealt with quickly and effectively prevent degradation of the aquatic habitats.

Species

Badgers

8.7.9 Due to the presence of setts within the Main Scheme footprint, it would be necessary to permanently exclude badgers under licence from NE. The setts would need to be destroyed prior to construction, and outside of the badger breeding season (i.e. 30 November until 30 of June). As the setts have been classified as subsidiary or outlier setts, no artificial setts would be required. Mitigation to prevent injury to badger during works would include the provision of ramps into any open excavations to allow any badger that has fallen in to escape.

Bats

8.7.10 An inspection of trees and buildings would be undertaken prior to works, and a suitably experienced ecologist would supervise the tree felling and building demolition.

8.7.11 The construction works would include the removal of bridges and construction / installation of new bridges, and the strengthening of an existing culvert. The

bridges are located close to bat foraging areas, therefore any intrusive activities that would cause noise or vibrations with the potential to disturb a roost would be undertaken outside hibernation periods where possible. Bore piling, a method that comprises screwing an auger into the ground to remove soil and create a cylindrical void, would be recommended for use rather than pile driving to minimise vibrations.

8.7.12 The bridge installations over the A20, A2070 and M20 routes would be undertaken at night-time. Additionally, lighting would be required for the security of the site compound. All lighting would be directed to minimise light spill and intrusion of dark skies, to avoid negatively impacting bat foraging behaviour. Boarded fencing would be installed if necessary to prevent light spill into key habitats, so that dark corridors would be maintained.

8.7.13 Habitat loss and fragmentation would reduce the foraging availability and disrupt dispersal routes into and within the Scheme boundary. Bat hop overs, comprising Heras fencing and potted trees, would be installed to maintain flight routes over the construction area. Additionally, the construction programme has been phased to ensure that the habitat clearance and construction works would be staggered, in order to maintain sufficient structure to support prey species and foraging availability.

Birds (Breeding and Wintering)

8.7.14 Vegetation clearance to facilitate the Main Scheme would pose risks to nesting birds, including killing or injuring due to physical removal of the trees whilst birds are present, or due to disturbance or destruction of a nest. Mitigation would entail avoidance by undertaking vegetation clearance during the bird breeding season (March – September), or for the vegetation to be checked by an experienced ecologist and provide supervision throughout the operation so that appropriate action could be taken.

8.7.15 Construction activities and presence of the site compound would have the potential to cause disturbance to birds. Night working would be avoided where possible, but would be required for some construction works. To minimise the potential for the illumination to cause disturbance to birds, the lighting would be directed into the working area only. Construction works would avoid the use of highly intrusive machinery where possible, for example with the use of bore piling rather than pile driven methods. Plant and vehicles would be required to soft start, so that sudden noise is minimised. The proposed location of the site compound has avoided areas where skylarks have been observed. Due to baseline conditions, birds present are habituated to the noise from existing transport links (the Highway routes and CTRL network), which would reduce their sensitivity to loss of tranquillity.

8.7.16 In addition, mitigation has included the avoidance of key habitats such as mature trees, and has sought to minimise clearance where possible.

Dormouse

8.7.17 A combination of vegetation clearance methods is proposed, with the majority of vegetation to be cleared in accordance with the 'winter clearance' method, outlined within the Dormouse Conservation Handbook[33] to persuade dormice to move away from the works area. A strip of habitat would be retained to enable dormice dispersal to the wider landscape. Dead hedging would be used where existing vegetation tapers out and presents gaps in connective habitat. This technique involves cutting trees and shrubs down to approximately 500mm between November and March, then clearing to ground level once dormice have emerged from hibernation. The remaining strip of connecting habitat would be cleared using the summer clearance method, where by sections no greater then 50m in length are cleared on successive days in 1 direction. All clearance would be undertaken under a European Protected Species Mitigation licence. A thorough search would be undertaken beforehand by an experienced dormouse worker, and clearance would be carried out by hand, and under the supervision of the dormouse worker.

8.7.18 Dormouse boxes and habitat piles would be provided for remaining populations, with the additional provision of a feeding station for the population within the Church Road woodland. This is to ensure there would be sufficient resources for the dormouse population to be maintained within a smaller habitat extent. The provision of nest-boxes is a tried and tested method to increase available habitat for Hazel Dormice and has been found to increase the size of hazel dormouse populations. The overgrown woodland along the M20 verges would be scalloped to provide a greater structural and floristic diversity, in order to promote the woodland edge conditions preferred by dormice. Log piles would also be installed within the scalloped areas.

Great Crested Newts (GCN)

8.7.19 The presence of GCN has been confirmed at Ponds 20 and 21, with occasional foraging use assumed at Redbur Pond. A small part of the Main Scheme footprint lies within 500m of the ponds, and is connected to the ponds by terrestrial habitat. This comprises the verge on the eastern side of Highfield Lane Bridge, along the London bound verge of the M20 and adjacent habitat. There is a risk of GCN presence within this strip of land, which have the potential to be killed, injured or disturbed during vegetation clearance and subsequent earth and construction works, therefore a capture programme would be undertaken under a European Protected Species Mitigation licence.

8.7.20 The majority of the Main Scheme footprint lies more than 500m from the confirmed GCN ponds, therefore the risk of GCN within the remaining Main Scheme footprint is considered negligible. However, absence cannot be completely discounted given the Main Scheme lies within the geographic range of the species. Therefore all site personnel would be made aware of the

[33] Bright et al. (2006) Dormouse Conservation Handbook

extremely low risk of presence and appropriate procedures in the unlikely event that an individual is found.

Reptiles

8.7.21 Activities during the site clearance and construction phase may result in harm to reptiles and would therefore need to be mitigated to avoid a legal offence. In areas of high reptile suitability (i.e. grassland habitats), reptiles would be persuaded to move away from the works area, with any remaining animals captured and relocated prior to construction. The persuasion strategy entails a winter cut to no lower than 500mm above ground, so that the habitat is less suitable and reptiles move away. This would reduce the number of individuals that would need to be handled, which can cause stress. However, some areas within the Scheme boundary would be subject to a capture and translocation programme only, since persuasion would not be effective given the existing habitat types (i.e. tall ruderal, and broad leaved and plantation woodland habitats).

8.7.22 Capture and translocation entails the installation of an exclusion fence around suitable reptile habitats, with internal drift fencing to compartmentalise the area. Artificial Cover Objects (ACOs) would be laid as refugia to attract reptiles so that they may be caught. Exclusion fencing around the higher quality habitat would effectively prevent reptiles from accessing the works area.

8.7.23 Following the capture programme, the grassland would be strimmed and supervised destructive searches and a top soil strip would be undertaken. All construction activities would be undertaken in accordance with the CEMP, an Outline of which can be found in Appendix 17.1, Volume 6.3.

8.7.24 The receptor sites for captured individuals south of the M20 would be the M20 London bound Highway verge, immediately to the east of the proposed Main Scheme for reptiles captured to the south of the M20. The verge is currently unsuitable for reptiles and would need to be made suitable by scalloping the edge of the tree line to provide more sunlight, and spreading hay to seed grassland and provide a thatch of material at ground level. Habitat piles would also be created to provide refuge opportunities. Reptiles captured to the north of the M20 would be relocated along the M20 coastbound verge to the east, and any found within the Mersham Quarry landfill site would be moved over the fence as the majority of the field would stay intact. Habitat improvements for these reptiles would also comprise installation of habitat piles and scalloping woodland edges as necessary.

8.7.25 Reptile habitat would be temporarily damaged and disconnected from other suitable habitat during the Main Scheme construction. The loss of extent would be mitigated by improving the habitat quality of the remaining areas to ensure the carrying capacity of the smaller areas of reptile habitat would be sufficient to support the population temporarily.

Riparian Mammals

8.7.26 Mitigation for otter would comprise an updated walk over survey with a close inspection of the banks within the proposed footprint for signs of current otter presence. In the highly unlikely event that a resting place (such as a couch or holt) is found within the working area, a mitigation licence would be required to obstruct and destroy it. Additionally, the culvert and Aylesford Stream corridor should be accessible through out works to maintain connectivity.

8.7.27 Water vole mitigation would include a passive displacement strategy immediately to the south of the M20 carriageway, by Lacton Farm Culvert. It is assumed that the provision of a temporary bridge to provide a haul route during the construction works could be installed without affecting water vole burrows or breaking connectivity along the riparian corridor, although vegetation clearance would be required. Therefore only 1 section of the Aylesford Stream would be subject to displacement. Habitat along the remaining length of the Aylesford Stream would be enhanced by strimming competitive species, such as stinging nettles *Urtica dioca*, and selective tree pruning to allow more light to the banks in order to encourage a wider botanical assemblage to benefit water vole.

8.7.28 The construction works and haul route are likely to cause noise, vibrations and visual disturbance that would affect the habitat integrity for water voles. The water vole population are accustomed to noise from the existing A2070 and M20 routes, and to occasional farmland operations. However, disturbance due to noise and vibrations from the construction works and use of the haul route would be greater, causing stress to individuals, reducing fitness and reproductive success. Fencing would help reduce the visual impact of vehicles and plant using the haul route, and the effect of noise and vibrations would be localised. The majority of the Main Scheme construction work (such as the A2070 link road) would be at least 15m from the Aylesford Stream, therefore impacts due to visual degradation, noise and vibrations would be minimised.

8.7.29 Good housekeeping would be required to prevent the encouragement vermin into the area by the availability of food. Any vermin control would need to ensure that no water voles are killed inadvertently.

Alternative Scheme – Construction

8.7.30 Mitigation for the Alternative Scheme during construction would be as detailed for the Main Scheme. There would be no additional requirements during the construction phase.

Main Scheme – Operation

8.7.31 The impacts described below will be present once the Main and Alternative Schemes are operational, however they will also be present during the construction phase to varying extents.

Designated Sites

8.7.32 There would be a permanent loss of 0.02ha of Highfield Lane RNR. This would be mitigated by the provision of 0.08ha immediately adjacent to the area that would be lost, using translocated turf strips supplemented with a grassland seed mix of the same botanical species composition. Therefore the compensation area would be greater than the existing extent.

Habitats

8.7.33 After the commission and reinstatement of the habitats (see Figure 2.5 contained in Volume 2), the Main Scheme impacts would be minimal during operation. The Main Scheme would not require any further temporary or permanent loss of habitat.

8.7.34 A pond in a neighbouring arable field would be enhanced prior to works in order to provide a suitable receptor site for amphibians (not great crested newts). The ponds would be replaced with 3 balancing ponds, at least 1 of which would provide aquatic habitat.

8.7.35 The habitats lost would not be replaced on a like-for-like basis, but the ecological attributes of the replacement habitats would be replaced with habitats of greater potential ecological value than the existing. Habitat planting to replace the integral ecological value of the habitats lost would not all be possible within the same locality, therefore compensation planting would be planted elsewhere and it is recommended that this would be undertaken prior to construction, since the planting areas would not infringe upon the works footprint. This would minimise the time lag between habitat removal and the availability of sufficiently mature and complex alternative habitats, capable of supporting the affected species. Short-term features that would provide ecological niche habitats would be provided. Habitat piles, including hibernacula, log piles, compost and wood chip piles, and buried hay, would provide a variety of structurally complex opportunities immediately, thereby boosting invertebrate species assemblages as well as providing shelter and prey items for predatory species. This includes the replacement of arable land with an area of species rich grassland. A programme of landscape aftercare would be undertaken following the construction of the Main Scheme to ensure the planting success and establishment of habitat.

8.7.36 Habitat planting would replace the 15.19ha habitats temporarily damaged (see Table 8.12) and compensate for the 3.96ha of habitat that would be permanently lost as hard standing (for example, the A2070 link road). Additionally, 3.43ha of planting would be undertaken to achieve net biodiversity gain to ensure greater long term (5 years) resilience against adverse events. This would mean 22.58ha of habitat would be planted in total.

8.7.37 Maintenance activities associated with ensuring safe travelling conditions have been considered during the design of the Main Scheme so that the activities could be undertaken with minimal damage. This has included the provision of access roads to balancing ponds. Although infrastructure such as

lighting has a finite life time, the luminaires would comprise LED lighting with a long-life and minimal maintenance requirements. This minimises the potential requirement for maintenance, including the excavation of verges to access services. Highway maintenance and small scale improvement projects are considered individually via non-statutory environmental assessments to minimise environmental impacts and would need to consider the landscape objectives and mitigation undertaken as part of the Main Scheme.

8.7.38 The Main Scheme has incorporated embedded mitigation to reduce the likelihood and severity of potential pollution incidents and flooding affecting the Aylesford Stream corridor. This has included the provisions of 3 balancing ponds and catch pits. One of these ponds would provide standing water habitat and would be of a greater extent than the 2 ponds lost during construction, more than compensating for the short term loss of habitat (2 – 5 years) in the long term (after 5 years).

Species

Badger

8.7.39 Habitat creation would be undertaken to provide foraging habitats of higher quality than the existing. These would include the 3 new balancing ponds and surrounds, woodland and species rich grassland. These would be augmented with habitat piles, such as partially buried hay, wood chip and logs, to encourage invertebrate availability during the period of habitat establishment. The landscape would also provide opportunities for badger sett creation. The provision of a mammal tunnel beneath the A2070 link road would provide connectivity between the created foraging areas. Additionally, a pipe bridge would be installed over the Aylesford Stream and a mammal ledge would be retrofitted to Lacton Farm Culvert.

8.7.40 Badgers would be deterred from crossing the A2070 link road by the installation of badger fencing around the Highways boundary. Although it is not possible to guarantee exclusion due to the tenacious nature of badger, the fencing in combination with the mammal tunnel and availability of high quality foraging should discourage their use of Highway verges, and minimise contact with traffic.

Bats

8.7.41 Habitat creation and replacement would provide more foraging habitat within the landscape, and planting of trees and hedgerows would provide connectivity for bats to commute between foraging grounds (refer to Figure 2.5 contained within Volume 6.2). Three balancing ponds would be built as part of the Main Scheme, and these would also provide foraging opportunities for bats. A range of bat boxes would also be installed to improve the availability of features within the landscape, including boxes suitable for hibernation and breeding purposes.

8.7.42 Although there was limited commuter activity observed flying towards and past the A2070 link road, trees would be planted on raised earth bunds along the A2070 link road to encourage high flight over the carriageway, reducing the risk of collisions with vehicles. Scrub would be planted between the trees to prevent avoidance of high flight. Additionally, due to the habitat creation that would be undertaken, alternative foraging areas would be available for any bats that abandon commuter routes. However, the Aylesford Stream corridor, the most important foraging and commuter route within the Scheme, would remain intact. The provision of a mammal tunnel at the northern end of the proposed A2070 link road would also be used by some species of bat as a means to cross beneath the A2070 link road.

8.7.43 The Main Scheme would include the provision of lighting. The design has sought to minimise potential impacts by using shorter lighting columns with directed luminaires and back plates to reduce spill. The lighting would comprise LED luminaires that would be less attractive to flying insects, so that bats are not attracted to forage on insects that can be attracted to traditional lighting, particularly ultraviolet spectrums. Additionally, lit bollards would be installed along footpaths and lit handrails used for footbridges in order to retain dark corridors along commuter and foraging routes. Most of the species recorded during the surveys are less sensitive to artificial lighting and are unlikely to abandon the routes. Some areas within the Scheme boundary would be darker as lighting along the eastern slip roads from the existing junction 10 interchange would be turned off.

8.7.44 There would be a risk of bats colliding with vehicles along the A2070 link road. The provision of a green bridge or under bridge was considered but was deemed to be a disproportionate measure given the populations and species of bats recorded during the surveys and level of risk. The vehicles using the A2070 link road would be travelling slower, due to the low speed limit, and as the taller Heavy Goods Vehicles would be moving slowly on entry and exit to the A2070 roundabout and junction 10a gyratory, where bats are most likely to cross over the carriageway. The mitigation already described would help to minimise the risk of collision, although this risk could not be completely discounted as possible to occur.

Birds (Breeding and Wintering)

8.7.45 Habitat creation and replacement would provide a greater extent of habitat suitable for breeding and wintering birds. The planted habitats would be of a higher quality than the existing habitats available at baseline, and connectivity would be improved. Habitat creation and replacement would include woodland, hedgerow, and grassland planting, using native species of local provenance where possible. The 3 balancing ponds would also provide new habitat for birds, and nest boxes would be provided to improve breeding opportunities. Although no arable land would be created, the replacement habitats would be of higher quality, providing a greater botanical diversity to support a wider range of invertebrates and a more complex mosaic of habitat structures. Nest boxes would also be installed to benefit the species recorded within the Scheme boundary.

8.7.46 There is potential for disturbance to bird habitats during the operational phase due to loss of tranquillity from vehicle noise. Noise attenuation measures, including raised earth bunds, acoustic fencing and low noise surfacing has been included as part of the design which would help to minimise noise from the passing vehicles.

8.7.47 Birds flying between the north and the south sides of the A2070 link road would have a greater risk of collision than at present. However, there would be a low speed limit in place along the A2070 link road, and therefore the risk of collision would be minimal given birds are habituated to the local landscape, which is highly urbanised.

Dormouse

8.7.48 Habitat replacement and the creation of new habitats as compensation for habitat loss would provide greater habitat availability and improved habitat connectivity in the long-term. It is acknowledged that this would take some time to establish, with a gap of between 3 and 5 years from the time of planting. The new habitats would be planted on a 2-for-1 basis, prior to the start of construction works so that the habitats would become established and suitable for dormice to colonise as soon as possible. Compensation and replacement planting would comprise nut and berry producing tree and shrub species which will provide good foraging habitat and will also ensure a net gain of hazel dormouse habitat. All new planting would comprise native and appropriate species of trees and shrubs which would be sourced as locally as possible. Nest boxes and hibernacula previously installed would continue to be available and monitored in accordance with the Dormouse European Protected Species mitigation licence.

8.7.49 Lighting would illuminate adjacent habitats, but due to the sensitive design which has incorporated directed, low level lighting (see bats), the impact on dormice would be minimised.

Great Crested Newts

8.7.50 The Main Scheme would require the installation of drainage infrastructure along the slip roads, A2070 link road and junctions. GCN can become trapped in these features, causing mortalities although the potential for GCN to encounter the new drainage features is unlikely to increase due to the Main Scheme. Design solutions have been recommended to reduce the risk of mortality in any such events. Examples of design solutions are included in the DMRB [34] or gully pot ladders can be fitted[35].

8.7.51 Habitat creation and replacement would provide better terrestrial habitat and connectivity, and hibernacula and habitat piles would ensure refuge availability

[34] DMRB (2001) *Nature Conservation management advice in relation to amphibians* Volume 10 Section 4 Part 6 HA 98/01

[35] Mcinroy, C. and Rose, T. (2015) Trialling amphibian ladders within roadside gullypots in Angus, Scotland: 2014 impact study, *The Herpetological Bulletin* **132**; pages 15 – 19.

and foraging opportunities whilst the habitat establishes. Additionally, the proposed balancing ponds may become suitable habitats for GCN in the short – medium term; due to their size the process of naturalisation to become suitable habitat is likely to be more than 5 years. GCN may eventually gain access to the ponds via the proposed hedgerows and the mammal or reptile tunnels, although they would first need to cross 2 local roads. The proposed new balancing ponds have been designed to ensure any future maintenance works can be undertaken with minimal risk of harm to GCN or other amphibians.

Reptiles

8.7.52 The landscape strategy includes replacement and creation of habitats of value to reptiles, such as grassland, scrub, woodland glades and the provision of log and brash piles. Habitat creation, as compensation for habitat loss and for net biodiversity gain, would be undertaken prior to the start of works and on completion of localised areas during appropriate planting seasons. Habitat management would be undertaken for the benefit of reptiles, to develop a mosaic of structurally diverse vegetation and open areas. This would provide a range of basking and shelter opportunities with a desirable variety of humidity and temperature conditions.

Riparian Mammals

8.7.53 The presence of the proposed A2070 link road and associated roundabouts would isolate the remaining land area between the link road, A2070 and M20 routes, forming a triangle of land. However, the Aylesford Stream corridor would provide connectivity for water vole, and the provision of the mammal tunnel and reptile tunnels would provide terrestrial dispersal opportunities. Noise from the A2070 link road would be greater than the baseline level, but is not anticipated to affect water vole given they use the culvert entrance beneath the A2070 carriageway, and are habituated to the noise.

8.7.54 Habitat creation, including grassland, woodland and 3 new balancing ponds, has been proposed as part of the Main Scheme. One of the ponds could provide aquatic habitat as it has been designed to hold water, and another pond would provide flooding attenuation for greater resilience against adverse events. These habitats would be beneficial for water vole, and would include plant species preferred by water vole for foraging. There is potential for surface water runoff from the A2070 link road to affect the balancing ponds, and therefore in an extreme but all be it unlikely event, such as a major fuel spill, water vole habitats should be audited following the event, and react according to the situation. It is assumed that works within the Hinxhill former landfill site would be undertaken in such a way as to prevent any leachate or similar from contaminating the Stream.

Alternative Scheme – Operation

8.7.55 The Alternative Scheme comprises a roundabout along the A2070 link road, and an off-slip road. This would break the connective semi natural habitat

along the edge of the A2070 link road (see Figure 2.6 contained within Volume 6.2). However, as the slip road would be relatively narrow and traffic would be moving slowly at the point of intercept, species would be able to cross the road with a low risk of mortality. To mitigate this risk, additional planting was included in the design to further narrow the gap between the tree and hedgerow habitat, and to channel individuals to the narrowest point at which to cross.

8.8 Predicted Nature Conservation Effects

8.8.1 A detailed assessment has been undertaken for any potential impacts above the magnitude level of a no change / negligible unlikely effect on protected species (refer to Appendix 8.3 to 8.10, Volume 6.3). Impacts on designated sites and habitats are described in this Chapter only (as below). The assessment follows the criteria for the 'Characterisation of Ecological Impacts', according to 'Interim Advice Note 130/10, Ecology and Nature Conservation: Criteria for Impact Assessment'. This characterises each impact on each receptor, taking into account the type of impact, the probability of it occurring, the complexity of it, the extent, size, reversibility, duration and timing of the effects. The mitigation proposals are also considered, along with the residual impacts thereafter and whether or not they would be significant following the proposed mitigation plans. The results of the detailed assessment are summarised below.

Main Scheme – Construction

Designated sites

Hatch Park SSSI

8.8.2 There would be no loss of habitat or integrity to the Hatch Park SSSI. Therefore the magnitude of impact would be No Change, leading to a Neutral residual effect at the Local scale from the construction works during this phase of the Main Scheme. Confidence of prediction would be Certain.

Ashford Green Corridor

8.8.3 To facilitate the construction of the footbridge over the A2070 0.12ha of broadleaved woodland and amenity grassland habitat within Ashford Green Corridors LNR will be permanently affected during construction. These habitats are recognised as a qualifying feature of the designation. However, the loss of habitat will be from the periphery and therefore is likely to be exposed to higher levels of pollution and disturbance. Combined the total loss represents 0.06% of the overall habitat extent. The magnitude of impact due to the loss of habitat would be Negligible, with a Neutral effect at the Local scale. The level of confidence is Near Certain.

Highfield Lane RNR

8.8.4 Within Highfield Lane RNR the semi-improved grassland habitat which is recognised as a qualifying feature would be permanently affected during construction. This habitat is of importance for a variety of butterflies. To facilitate the proposed works 0.02ha of habitat will be affected during construction. This represents 29% of the overall habitat extent. The initial magnitude of impact due to the loss of habitat would be Minor Adverse, with a Slight Adverse effect given the proportion of loss from the overall extent at the Local scale. The level of confidence is Certain.

Habitats

8.8.5 The habitats that would be affected during construction are detailed in Table 8.12.

Table 8.12 Type and area of habitat being disturbed during construction

Type of Habitat	Habitats temporarily damaged
Native species-rich hedgerows	0.15ha (457m linear length)
Native species-poor hedgerows	0.17ha (278m linear length)
Semi-improved grassland	2.68ha
Reed bed	0.47ha
Running water	0.02ha
Broadleaved semi-natural woodland	2.22ha
Scrub	0.34ha
Plantation woodland	0.2ha
Total	15.19ha

Hedgerow Habitats

8.8.6 Hedgerow habitat will be affected as a result of the Main Scheme. There would be a loss of 457m of species-rich and 278m of species-poor hedgerow. Three have been identified as important under the Hedgerow Regulations (1997). The hedgerows affected by the Main Scheme are likely to be utilised as wildlife corridors by birds and small mammals. Therefore the removal of these habitats would potentially disrupt movement of these species to habitats within the wider landscape resulting in a Minor Adverse magnitude of impact during construction. This would give a Slight Adverse effect at National level. Confidence of prediction is Certain.

Running Water / Aylesford Stream

8.8.7 The Main Scheme would cross Aylesford Stream and affect 0.02ha of running water and marginal aquatic vegetation. This habitat is considered to be of importance for water voles, however, given that the loss represents a small proportion of the overall habitat available the magnitude of impact is predicted

to be Negligible. This would give a Neutral effect at County level. Confidence of prediction is Certain.

Broadleaved Semi-Natural Woodland

8.8.8 The Main Scheme would affect linear strips of broadleaved semi-natural woodland alongside the M20 and A2070 verges. In total there would be a loss of 2.22ha broadleaved woodland. These habitats are known to support badgers, dormice and commuting and foraging bats. The removal of this habitat would result in **a** Minor Adverse magnitude of impact during construction. This would give a Neutral effect at County level. Confidence of prediction is certain.

Scattered trees, scrub, Broadleaved and Mixed Plantation Woodland; Poor semi-improved neutral grassland

8.8.9 Several areas of scattered trees, scrub, plantation woodland and poor semi-improved neutral grassland will be affected by the Main Scheme. Overall, the removal of these habitats constitutes a small proportion of the overall extent. As these habitats are of low conservation value, this loss is considered to represent a Minor Adverse magnitude of impact. This would give a Neutral effect at Local level. Confidence of prediction is Certain.

Species

Badger

8.8.10 The Main Scheme would directly impact 1 active subsidiary sett, an outlier sett, and a disused subsidiary sett in order to undertake earth works as part of the construction works. The setts would need to be closed to the badgers under licence in order for the setts to be destroyed. Additionally, 15.19ha of semi-natural habitats would be temporarily damaged during the construction works, with a further 3.96ha of habitat subject to vegetation clearance. This constitutes 57% of the habitat within the Scheme boundary, and therefore the availability of foraging habitat would be reduced. Access to the wider area, which has suitable habitats for badgers for both foraging and sett creation would not be restricted during the construction and badgers would be able to move into these adjacent areas.

8.8.11 The mitigation measures proposed are tried and tested techniques that are frequently applied as mitigation during development. In summary, the magnitude of impact during construction would be Minor Adverse due to the closure an active sett used by a small clan and the loss of foraging habitat. This would have a Neutral effect at the Local level given the availability of alternative habitat within the wider surrounds, low activity and small clan using a single active sett within the Scheme boundary. The confidence of prediction is Near Certain, due to the sporadic and seasonal activity recorded.

Bats

8.8.12 The habitats within the Scheme boundary were assessed as having moderate habitat quality to support bats. Data gathered from bat surveys identified foraging and commuting areas on-site, mostly used by common species, with occasional records of individuals of rarer species also present. The surveys confirmed common and soprano pipistrelles forage along hedgerow and tree lines.

8.8.13 The Main Scheme has been designed to avoid key habitats, including the Aylesford Stream corridor which would be subject to a 6% loss during construction works. There would also be a 50% loss of hedgerow habitats, and 31% loss of broadleaved woodland and plantation woodland habitats. No trees or structures to be cleared or demolished were confirmed to be used as a bat roost at the time of the surveys. Two confirmed roost sites were identified within 100m of the Scheme boundary at St Marys Church and Redbur House (Appendix 8.3, Volume 6.3). The construction works are anticipated to be undertaken over an 88 week duration, with the recommendation that any high impact activities avoid winter to prevent disturbance of any roosts during hibernation.

8.8.14 Overall, the construction phase is predicted to have a Minor Adverse magnitude of impact with a Slight Adverse effect in the short-term at Local level, with the application of mitigation measures outlined, which are tried and tested methods frequently applied for development schemes. The confidence of prediction is probable.

Birds

8.8.15 Thirty nine species were recorded during breeding bird survey, with 8 species confirmed to be breeding on site, all of which were associated with trees, hedgerows or scrub breeding habitats. Additionally, 6 noteworthy species were considered to be probably breeding in low numbers. Clearance of any vegetation during the breeding season (March to August inclusive) would be likely to result in a risk of mortality and the destruction of nests. It is considered likely that adherence with the mitigation measures outlined would successfully mitigate this impact. The loss of habitat (including 50% loss hedgerow and 31% loss of woodland habitat types) would reduce the amount of breeding habitat available in the short term. Although this impact cannot be mitigated, these habitats are widely available within the wider surrounds. These impacts in combination with disturbance from construction activities would constitute a Minor Adverse magnitude of impact due to the availability of alternative habitats. A Slight Adverse effect at the Local level is considered probable to occur.

Dormouse

8.8.16 The construction of the Main Scheme is predicted to impact 3 dormouse populations, 2 of which were confirmed as present during surveys and 1 population has been assumed on the basis of the habitat available. Vegetation

clearance would be undertaken using a phased approach to persuade dormice from the area to minimise risks of killing or injuring individuals. Mitigation proposals include the provision of nest boxes and the creation of hibernacula for each population so that the carrying capacity of the remaining habitats would be increased.

- London bound M20 Embankment: Vegetation clearance would comprise 39% of the available dormouse habitat. Given the limited amount of habitat available, the population estimate of dormouse is small, but any remaining dormice would be isolated within sub-optimal habitat. With the mitigation outlined to persuade dormice to disperse to other habitats to the east of the site, supported with the creation of a dead hedge to link currently fragmented habitats, a Minor magnitude of impact to the dormouse population is predicted.
- Church Road: Approximately 40% of the available habitat would be subject to clearance, although the habitat would be damaged in the short-term only. Mitigation would include the provision of a feeding station at this location to supplement the foraging availability, therefore a Minor magnitude of impact to the dormouse population is predicted.
- North of M20: Approximately 28% of the overall available habitat would subject to vegetation clearance, although adjacent habitats would still be available for dormice to disperse into so no fragmentation or isolation is expected. A Minor magnitude of impact to the dormouse population is predicted.

8.8.17 Providing the mitigation outlined are undertaken, including adherence to a European Protected Species Mitigation licence method statement, it is anticipated that the vegetation clearance and loss of habitat would constitute a Minor magnitude of impact at the Local level overall. This would cause a Slight Adverse short term effect. The degree of confidence is Near Certain.

Great Crested Newts

8.8.18 Overall, the likelihood of GCN presence in the Main Scheme footprint is considered low given the absence of GCN from ponds during the surveys undertaken in 2015. However, presence cannot be completely discounted given the location of the area with the GCN distribution range. With the mitigation and precautionary measures applied, any individuals found within the Main Scheme footprint during construction works would be safeguarded, but no methodology can guarantee that no deaths or injuries would occur. In the highly unlikely of death or injury during works, the population size class would not be affected.

8.8.19 A medium population size of GCN has been identified from historic records within 2 ponds outside the DCO boundary. A small area (0.77ha) of terrestrial habitat terrestrially connected to the ponds would be temporarily damaged during works, with a further 0.8ha of vegetation clearance required. Exclusion fencing and a capture relocation programme (under a European Protected Species mitigation licence), would be undertaken to safeguard any GCN present. Any GCN caught would be moved to purpose built hibernacula. The

availability of terrestrial habitat would be reduced whilst the exclusion fencing is in place, but any GCN moved would be able to access other suitable habitats within the wider area. Given the scale of temporary habitat loss within the wider context, a Negligible magnitude of impact is anticipated, with a Neutral effect at the Local scale. The degree of confidence is Certain.

Reptiles

8.8.20 Exceptional populations of slow worms and common lizards were recorded, with a low population of grass snake. Areas of the most optimal habitat for reptiles would not be subject to clearance (i.e. the M20 verge to the east of the junction 10 Interchange) therefore reptiles in those areas would not be subject to either mitigation measure described in Section 8.7.

8.8.21 The clearance of vegetation and earthworks associated with construction would damage 2.68ha of suitable habitat (i.e. semi improved grassland), and a further 1.01ha of semi-improved grassland would be subject to vegetation clearance. These areas constitute 77% of the habitat within the Scheme boundary. Mitigation (as outlined in Section 8.7), including habitat enhancement along the Aylesford Stream corridor (comprising 90% of the 0.3ha available), and enhancement of the retained semi-improved grassland (1.11ha) would support reptiles moved by persuasion. Additionally, the creation of a receptor site along the M20 eastbound verge would support any individuals captured as part of an exclusion and capture programme to the south of the M20. Individuals caught to the north of the M20 and A20 routes would be moved to adjacent suitable habitats. Therefore the number of individuals moved from each affected area would be small. Therefore the welfare of individuals would be safeguarded and the populations maintained during the construction phase.

8.8.22 The vegetation clearance and loss of habitat described would result in a Minor Adverse magnitude of impact at the Local level. The recommended mitigation would ensure that the impacts are minimised and that the risk of committing a legal offence is reduced, with a Slight Adverse effect. This is a tried and tested mitigation strategy. The degree of confidence is certain.

Riparian Mammals

8.8.23 A medium population density of water vole was confirmed following surveys along the Aylesford Stream corridor. No signs of otter were found, but occasional presence has been assumed.

8.8.24 Site clearance would comprise the removal of 10% of the available riparian habitat as part of the displacement strategy undertaken under the supervision of a class licence holder, and the construction of the bridge for the slip road. The majority of the Aylesford Stream would be left intact during the construction works, although another area would be subject to indirect impacts due to disturbance from passing plant and vehicles via a haul route that would cross over the Aylesford Stream.

8.8.25 These impacts would have a Minor Adverse magnitude of impact due to the reduction and disturbance of habitat. This would result with a Slight Adverse effect at Local level, as the works are of short duration so would not affect the status of water vole at County level. Confidence of prediction is Probable. In the unlikely event that an otter resting place is identified prior to works, and with the implementation of the mitigation identified, a Negligible magnitude of impact is anticipated as the otter would be likely to disperse in any case. Therefore a Neutral effect is expected. Confidence of prediction is Certain.

Alternative Scheme – Construction

8.8.26 The impacts of the Alternative Scheme would be the same as those experienced on the Main Scheme. No further habitats of value or species would be impacted directly or indirectly.

Main Scheme – Operation

Designated Sites

Hatch Park SSSI

8.8.27 Hatch Park SSSI would be subject to increased levels of airborne pollutants once the Main Scheme is operational (1.2% increase at the closest point, reducing with distance from the Main Scheme). The total nitrogen deposition would be higher than the recommended Critical Load Ranges for the habitat types that the SSSI supports. However, these levels are already predicted to be exceeded in the opening year without the Scheme (see Chapter 5 Air Quality, Volume 6.1). In the opening year of the Scheme total nitrogen deposition will reduce compared to existing levels. Therefore a Negligible magnitude of impact is anticipated with a Slight Adverse effect, given the National conservation value of the receptor. Confidence of prediction is Certain.

Ashford Green Corridor

8.8.28 There would be no further loss of the LNR during the operational phase. No impacts, such as illumination from lighting, or additional disturbance from public recreation are anticipated. Therefore a No Change magnitude of impact with a Neutral residual effect at the Local scale is Certain.

Highfield Lane RNR

8.8.29 Following completion of construction, habitat planting would be undertaken to replace the habitat temporarily damaged during construction. Additionally, due the permanent loss of 0.02ha of Highfield Lane RNR, an area of 0.08ha immediately adjacent to the area that would be lost would be planted as compensation for the loss. Therefore the area available for the flora and fauna for which the site supports would be larger, ensuring greater resilience and larger populations of the species assemblage. Additionally, given that other areas would be planted as species rich grasslands, the RNR would be part of

a wider network of grassland habitats available in the immediate surroundings. Therefore a Minor Adverse magnitude of impact with a Slight Beneficial residual effect at the Local scale is Certain.

Habitats

8.8.30 Habitat planting would replace the 15.19ha habitats temporarily damaged (see Table 8.12) and compensate for the 3.96ha of habitat that would be permanently lost as hard standing (for example the A2070 link road). Additionally, 3.43ha of planting would be undertaken to achieve net biodiversity gain to ensure greater long term (5 years) resilience against adverse events. This would mean 22.58ha of habitat would be planted in total, as outlined in Table 8.13 below.

Table 8.13 Habitat replacement and compensation during Operation

Type of Habitat	Permanent habitat lost during Operation	Percentage of overall habitat extent lost	Compensation Planting	Habitat creation
Native species-rich hedgerows	0.03ha (134m linear length)	22%	No net loss. Replanted with native species-rich hedgerows.	0.21ha
Native species-poor hedgerows	0.18ha (7m linear length)	2%	No net loss. Replanted with native species-rich hedgerows.	
Arable fields	0.86ha	6%	Compensated for by creation of alternative habitat	14.19ha species rich grassland
Semi-improved grassland	1.01ha	21%	No net loss. Reinstatement and creation of grassland with species-rich seed mix.	
Reed swamp	0.0ha	0%	No net loss. Replanted with native aquatic species.	0
Ponds	N/A	N/A	Two ponds lost	Three ponds created
Running water	0.0ha	0%	No net loss.	0
Native scattered broad-leaved trees	26 no.	-	No net loss. Replanted with native species.	4.89ha broadleaved woodland created
Broadleaved semi-natural woodland	0.79ha	11%	No net loss. Replanted with native woodland species.	
Scrub	0.22ha	37%	No net loss. Reinstatement of scrub.	
Mixed plantation woodland	0.05ha	8%	No net loss. Replanted with native woodland species.	
Broadleaved plantation woodland	0.12ha	36%	No net loss. Replanted with native woodland species.	
Total	3.96ha			22.58ha

8.8.31 Hedgerows, trees, scrub and woodland would be replanted with native species and be targeted at areas most affected by the Main Scheme. This would ensure the wildlife corridors for birds and mammals are maintained. Species poor hedgerows would be replaced with a species-rich composition of local provenance, which would increase the biodiversity of the area. Mitigation for the loss of semi-improved grassland would be provided through the translocation of turf and soil, supplemented with the replanting and creation of a species-rich compensatory area using a native species-rich seed mix similar in composition and of local provenance.

8.8.32 Together with extent of replacement planting the biodiversity gain, and the restoration of wildlife corridors, the habitat planting would ensure that adverse effects would be mitigated for and the magnitude of impact during operation would be Negligible at the Local scale. Following maturation of the planting, it is anticipated that the residual effect be Slight Beneficial. The confidence of prediction is Certain.

Species

Badger

8.8.33 The badger tunnel, retrofit of the Lacton Farm culvert with a mammal ledge, installation of the pipe bridge and hedgerow planting would replace connectivity between foraging areas and sett habitat. Habitats planted to replace those damaged or as compensation for habitats lost would be of higher ecological function and of greater extent than those currently available. This would ensure a Minor Beneficial magnitude of impact, giving a Slight Beneficial residual effect to badger at the Local level. The confidence of prediction is Certain.

Bats

8.8.34 Due to the presence of additional lighting and the operation of the A2070 link road the impacts are predicted to have a Minor Adverse magnitude of impacts at Local level. However, the 3 balancing ponds; 14.19ha of grassland; and 4.89ha of tree, scrub and woodland habitats that would be planted to replace habitat damaged, as compensation for loss, and for net biodiversity gain, the site would provide higher quality habitat than at baseline. Additionally, bat boxes would provide year round roosting opportunities. Therefore, a Slight Beneficial residual effect is predicted in the long term once the habitats have become established. The confidence of prediction is Near-Certain.

Birds

8.8.35 It is anticipated that the habitat planting (as previously described), installation of nest boxes, and the implementation of the design features, such as quiet road surfaces and directed lighting would constitute a Slight Beneficial magnitude of impact once the habitats have become established. This would give a Slight Beneficial effect at the Local level that is considered Probable to occur. It is considered unlikely that the benefit of the habitat creation would

raise the effect to County level, as any increase to species richness cannot be anticipated at this stage. Therefore the residual effect is not significant.

Dormouse

8.8.36 There would be a permanent loss of dormouse habitat (2.78ha) and fragmentation during the Operational phase. Mitigation to compensate for that loss would comprise 4.72ha of habitat creation and 550 linear metres of hedgerows to connect those habitats would ensure that the populations would be more successful long-term. The connective habitat would increase opportunities for the populations to interbreed, and have greater resilience against disease, with more habitat available to form a buffer against unfavourable weather or environmental change. It is anticipated that the loss of habitat would give a Minor Adverse magnitude of impact, with habitat creation and compensation leading to a Slight Beneficial residual effect at the Local level. The degree of confidence is Certain as the habitat availability and quality during the Operational stage would be better than the existing habitats once they have become established.

Great Crested Newt

8.8.37 There would be a permanent loss of terrestrial habitat during the operational phase, comprising 0.8ha. However, the remaining terrestrial habitat would be of a higher quality following planting to replace habitat damaged during the construction phase. Additionally, there would be net biodiversity gain of 2.38ha with woodland habitat creation on land that is currently arable. With well-considered design of the drainage infrastructure and balancing ponds, risks to individual GCN during the operational phase would be minimal. Therefore the overall magnitude of impact to GCN at Local level would be Minor in the operational phase and long term, with a Slight Beneficial residual effect. The degree of confidence is Certain.

Reptiles

8.8.38 During the Operational phase, there would be a permanent loss of 1.01ha of semi improved grassland. Habitat planting would comprise 14.19ha of species rich grassland. This would include the replacement of grassland (3.64 hectares) and arable land (5.44ha) damaged during construction, as well as compensation planting for the permanent loss. However, an additional 10.09ha of species rich grassland habitat would be planted for net biodiversity gain, which would benefit reptiles in the long term once the habitats have become established. Habitat connectivity would be facilitated with the provision of a purpose built reptile tunnel beneath the A2070 link road, although a drainage pipe and the mammal tunnel could also be used. Therefore populations would not be fragmented and become susceptible to genetic regression, as would otherwise be the case. The habitat creation together with a commitment to long-term habitat management, have the potential to enhance the conservation status of the reptile assemblage within the Site. Therefore the permanent loss of habitat would have a Minor Adverse

magnitude of impact at the Local level, with a Slight Beneficial residual effect considered Certain to succeed.

Riparian mammals

8.8.39 The Operational phase would not affect the connectivity of habitat for water vole, and due to habitat creation within the wider landscape (as previously described), foraging habitat availability would be better than the habitat currently present, along with more opportunities to evade mink and flooding events. This would ensure a more resilient population more able to adapt and respond to unfavourable events. Additional noise from the A2070 link road is not predicted to affect water vole. Therefore a Minor beneficial magnitude of impact with a Slight Beneficial residual effect is anticipated at Local level, with a Certain confidence of prediction.

8.8.40 In the event of occasional passage through the site by otter, there would be a low risk of road mortalities. The badger fencing and provision of a mammal tunnel beneath the A2070 link road would mitigate this risk, and the retrofit of the mammal ledge at Lacton Farm Culvert would improve the connectivity of the Aylesford Stream corridor. Therefore a Minor beneficial magnitude of impact with a Slight beneficial residual effect is predicted at Local Level. The confidence of prediction is Certain.

Alternative Scheme – Operation

8.8.41 The addition of a three-arm roundabout located midway along the proposed A2070 Link Road would break the connective semi natural habitat along the edge of the A2070 Link Road. However, as the slip road would be relatively narrow and traffic would be moving slowly at the point of intercept, individual animals would be able to cross the road with a low risk of mortality. Additional planting was included in the design to further narrow the gap between the tree and hedgerow habitats.

8.8.42 The additional magnitude of impact of the Alternative Scheme in combination with the Main Scheme would be Negligible with a Neutral effect given the habitat planting described The degree of confidence is Near Certain.

Residual Effects

8.8.43 The residual effects for both the Main and Alternative Schemes are summarised in Table 8.14.

Table 8.14 Summary of impacts during construction and operational phases and residual effects

Ecological Receptor	Conservation Value	Magnitude of Impact (with mitigation) during Construction	Magnitude of Impact (with mitigation) during Operation	Residual Effect
Hatch Park SSSI	High / National	No change	Negligible	Slight Adverse
Ashford Green Corridor	Medium / County	Negligible	No change	Neutral
Highfield Lane RNR	Low / Local	Minor Adverse	Minor Adverse	Slight Beneficial
Running water / Aylesford Stream	Medium / County	Negligible	Negligible	Slight Beneficial
Standing Water; Reed-bed; Ponds	Medium / County	Minor Adverse	Negligible	Slight Beneficial
Broadleaved Semi-Natural Woodland	Medium / County	Minor Adverse	Negligible	Slight Beneficial
Scattered trees, scrub, Broadleaved and Mixed Plantation Woodland	Low / Local	Minor Adverse	Negligible	Slight Beneficial
Hedgerow habitats	High / National	Minor Adverse	Negligible	Slight Beneficial
Poor semi-improved neutral grassland	Low / Local	Minor adverse	Negligible	Slight Beneficial
Invasive species	Low / Local	Negligible	Negligible	Neutral
Bats	Medium / County	Minor Adverse	Minor Adverse	Slight Beneficial
Birds	Medium / County	Minor Adverse	Negligible	Slight Beneficial
Badger	Low / Local	Minor Adverse	Minor Beneficial	Slight Beneficial
Dormouse	Low / Local	Minor Adverse	Minor Adverse	Slight Beneficial
Great crested newts	Low / Local	Minor Adverse	Minor Beneficial	Slight Beneficial
Reptiles	Low / local	Minor Adverse	Minor Adverse	Slight Beneficial
Riparian mammals (Water vole, otter)	Medium / County High / National	Minor Adverse	Minor Beneficial	Slight Beneficial

8.9 Conclusions

8.9.1 The sensitive design of both the Main and Alternative Schemes and the comprehensive nature of the mitigation would ensure that there are no significant residual effects on any key or protected ecological receptors within the ZoI. A Slight Beneficial effect for nature conservation at the local level is predicted overall.

8.9.2 The risk of killing or injuring any species of value during site clearance prior to construction works would be minimised by the implementation of sensitive methodologies, undertaken in accordance with mitigation licences where appropriate, and as detailed in the Outline CEMP contained in Appendix 17.1, Volume 6.3.

8.9.3 Habitat planting would be undertaken to replace habitats temporarily damaged during construction or planted to compensate for permanent habitat lost, additional planting would be undertaken for net biodiversity gain (3.43ha). Where possible, compensation planting would be undertaken in advance to minimise the interval between loss and the availability of replacement habitats. Habitat planting would comprise species of local provenance, and selected to benefit the species identified during baseline surveys.

8.9.4 The Scheme design has included provisions for habitat connectivity, which would be reinstated by the provision of a mammal tunnel and a reptile tunnel beneath the A2070 link road, and a pipe bridge over the Aylesford Stream. Raised trees would encourage bats and birds to fly over traffic, and lighting specifications have been designed to be sympathetic to bat species. The provision of a mammal ledge at Lacton Farm Culvert would improve connectivity beneath the M20 carriageway for mammal species. The provision of bat boxes, bird nest boxes, dormouse boxes, hibernacula and a range of habitat piles would provide habitat features that would be favourable to species for breeding, foraging and refuge purposes. The success of the habitat planting would be affected by an aftercare programme to ensure the objectives for the habitat provisions are achieved, with long term habitat management undertaken sympathetically for the species present. Reptile and dormouse monitoring would be undertaken to monitor the populations present.