OXFORD TO CAMBRIDGE EXPRESSWAY Consultation by HIGHWAYS ENGLAND

Response from The Wildlife Trusts (England)

April 2018

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1. Background

The Wildlife Trusts are a movement of more than 800,000 members, 40,000 volunteers, 2,000 staff and 600 trustees, from a wide range of backgrounds and all walks of life, who share a set of common beliefs.

The Wildlife Trusts **believe** that:

- People are part of nature; everything we value ultimately comes from it - everything we do has an impact on it.
- The natural world is valuable in its own right, and is also the foundation of our wellbeing and prosperity; we depend on it and it depends on us.
- Everyone deserves to live in a healthy, wildlife-rich natural world.
- Everyone should have the opportunity to experience the joy of wildlife in their daily lives.

Our charitable **purpose** is to bring people closer to nature, and to make our land and seas rich in wildlife.

We want to **work with others** to bring about Living Landscapes, Living Seas and a society where nature matters.

Collectively as independent charities, the 47 Wildlife Trusts look after 98,500 hectares of land for nature conservation and public benefit. We operate more than 100 visitor and education centres and host more than 10 million visits each year to our 2300 nature reserves. We contribute actively to the health and wellbeing of many local communities and check tens of thousands of planning applications each year to evaluate their impact on the natural environment.

2. Introduction

This submission has been developed by The Wildlife Trusts in response to Highways England consultation on the Oxford Cambridge Expressway (hereafter referred to as the "Expressway") proposals, March 2018. The consultation document states:

"From what we have heard so far there is clearly a strong appetite to provide feedback to the Project Team and we have therefore taken the decision to give you as key stakeholders the opportunity to provide written feedback to Highways England by 12th April 2018 to inform the Summer 2018 Corridor Decision. To aid in our analysis of the feedback we would specifically ask you to provide your views framed around the following questions:

· *What is your preferred Corridor and why?*

· *Are there any Corridors you do not support, and why?"*

This consultation response is based on Highways England's Oxford to Cambridge Expressway Strategic Study – Stage 3 Report (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/571353/oxford-to-cambridge-expressway-strategic-study-stage-3-report.pdf) and

corridor information shared at the Oxford – Cambridge Expressway Strategic Environment workshop (23rd March 2018).

The Wildlife Trusts welcome the opportunity to comment on the above stakeholder consultation and our interest in this consultation focuses on the nature and biodiversity considerations in the proposed broad route corridors. The Wildlife Trusts do not comment on aspects of landscape quality, cultural or historic heritage or local communities even though we recognise that these things are also important.

The Wildlife Trusts consider the Oxford to Cambridge Expressway to be of national significance, however, the proposals will impact within the areas of two local Wildlife Trusts in particular, the Berkshire Buckinghamshire Oxfordshire Wildlife Trust (BBOWT) and the Bedfordshire Cambridgeshire Northamptonshire Wildlife Trust (WTBCN). This document will make reference to the relevant local Wildlife Trust where appropriate.

The Wildlife Trusts would be happy to meet representatives of Highways England in person to view some of the most ecologically rich areas within the three possible route corridors, and to discuss these comments at any time prior to a decision about a preferred corridor being taken. Any further information we can provide that will help inform your decision could potentially be provided on request (subject to data sharing agreements).

Structure of the response:

Copyright:

3. Summary of the Response

This chapter provides a brief summary of The Wildlife Trusts' response to the consultation. More detail is being provided in the following chapters.

What is your preferred Corridor and why?

The Wildlife Trusts have concerns about all the corridors and are not expressing a preference for a corridor.

Are there any Corridors you do not support, and why?

Whilst we have concerns about all three corridor options the corridor we have by far the most concerns about is Corridor B.

Corridor A

The Wildlife Trusts have serious concerns over Corridor A, however, these are fewer than those about Corridor B and Corridor C.

Corridor B

The Wildlife Trusts have their most serious concerns about Corridor B and consider that it would not be possible to take the route within this corridor without exceptionally serious impacts on biodiversity. As such we consider that the Corridor B option should be discounted.

Corridor C

The Wildlife Trusts have serious concerns over Corridor C. Corridors B and C are essentially the same in Oxfordshire and are considered to result in exceptionally serious impacts in biodiversity. Within Buckinghamshire, we also have concerns about Corridor C, however, these are less significant than those relating to Corridor B. If Corridor C is chosen then there are critically important wildlife sites within the corridor on which impact would need to be avoided.

Overall Summary Conclusion on Corridors

All three of the corridor options could give rise to significant nature conservation impacts, however, the central corridor raises the most serious concerns.

It is theoretically possible to envisage a route within Corridor B that avoids significant nature conservation assets, but the reality would result in a road so convoluted that it would fail to qualify as an expressway. The central corridor (Corridor B) raises the greatest concern as it would tend to draw new development towards the Ray Valley and Bernwood Forest areas, which are highly sensitive ecologically.

The Wildlife Trusts therefore express a definite preference that the central corridor (Corridor B) is NOT taken forward, whilst holding the position that both of the other corridors (Corridors A and C) could give rise to significant impacts on wildlife, which need to be taken into account if either of those corridors is chosen.

4. Overall Concerns

Consideration of biodiversity

We are extremely concerned that these options appear to have been drawn up without due consideration to biodiversity or the natural environment. Section 40 of the Natural Environment & Rural Communities Act (NERC) 2006 imposes a duty on all public authorities to conserve biodiversity when exercising their functions. Section 40(1) states:

"Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity."

The duty applies to all local authorities and extends beyond just conserving what is already there to carrying out, supporting and requiring actions that may also restore or enhance biodiversity. As such Highways England has a duty to consider ecological constraints from the outset to inform the selection of any corridors and not only when detailed routing is being considered. There is little indication that this has taken place and we are concerned that insufficient attention has been given to the natural environment when drawing up these options. Please see also comments on Strategic Environmental Assessment (SEA) below.

Development proposal

This consultation response is based on the assumption that the Expressway would not only comprise a road but will also facilitate a large amount of development. The magnitude of this and the related impact are impossible to judge at this point but the NIC report suggests that the Expressway could be a vehicle to help unlock the potential for growth including the building of several hundred thousand homes including a new town in the north of Buckinghamshire.

This response therefore considers impact for:

1. the Expressway route itself in terms of:

- direct habitat and species loss from the road and construction depots/construction access routes;
- impacts on ecological connectivity through hindering the movement of species;
- direct and indirect impacts caused by lighting / noise / air pollution / hydrological changes – both during construction and operationally;
- some increase in recreational impact on protected sites/priority habitat/species in areas close to the Expressway route junctions;

2. the likelihood that the Expressway route will be the key location for residential/commercial development as part of the National Infrastructure Commission proposed Oxford-Cambridge Growth Corridor, with potential impacts including:

- direct habitat and species loss from development;

- direct and indirect impacts caused by lighting / noise / air pollution / hydrological changes – both during construction and operationally;
- substantial increase in recreational impact on protected sites/priority habitat/species in areas close to developments with potentially substantial impact on biodiversity;

Development on this scale would inevitably have significant impact on the natural environment. Climate change is one of the greatest single long-term threats to wildlife and people and there are proven links that rises in CO_2, including those by car emissions, contribute to climate change. The Wildlife Trusts are therefore very concerned about road redevelopment on this scale and the implications it will have for greenhouse gas emissions and climate change. Should this proposal be considered any further it is of upmost importance that the route corridor avoids ecological impacts wherever possible and that design and measures are deployed that minimise growth in emissions and reduce them where possible.

Quality of information

The information provided with this consultation is high level and vague, leaving a lot of room for interpretation. This is also not helped by recent changes to the mapping, which add more uncertainty with regard to some of the route corridors rather than providing more clarity. For example Corridor B is up to 20km wide in places and in itself comprises several options by showing potential alignments around the East and the West of Oxford. The mapping is also confusing in so far as it is not only the grey areas that are common to all routes but also the dark pink areas.

In light of recent changes to the mapping stakeholders were kindly given the GIS layers, which have been very helpful when writing this response. However, a comparison of the corridors presented at the workshop and the GIS layers suggest that they are not exactly the same, raising concerns about the information subject to this consultation.

This response will therefore need to be treated "without prejudice" and we reserve the right to review our position on anything if and when more information becomes available.

Lack of Strategic Environmental Assessment "SEA" and public consultation

It is The Wildlife Trusts' view that strategic development proposals, such as the development of the Expressway, should be brought forward within a framework which has been subject to the process of Strategic Environmental Assessment (SEA).

Strategic Environmental Assessment (SEA) is the process, required to comply with European Directive 2001/42/EC, by which plans and programmes are reviewed, with consideration of alternatives. Paragraph 15 of the preamble to the directive establishes a requirement for public consultation as part of the process:

"(15) In order to contribute to more transparent decision-making and with the aim of ensuring that the information supplied for the assessment is comprehensive and reliable, it is necessary to provide that authorities with relevant environmental responsibilities and the

public are to be consulted during the assessment of plans and programmes, and that appropriate time frames are set, allowing sufficient time for consultations, including the expression of opinion."

The proposals for the Expressway are being brought forward as a project arising from the national Road Investment Strategy. That strategy has not been subject to an SEA, and DfT have indicated that there is no intention to undertake an SEA of the route corridor selection. There is however a clear commitment to undertaking an Environmental Impact Assessment which will look at alternatives within the chosen corridor.

The effect of not undertaking an SEA is that there will be no full public consultation which will allow comment on the environmental impacts of the choice of the corridor. Although there will be a consultation relating to the subsequent detailed route selection, clearly many alternatives will have been ruled out by this stage. There is a particular concern that, depending on which corridor is selected, routes that could avoid impacts on one or another key nature conservation sites will have been ruled out. The corridor selection will have a major influence on the location of future housing, and therefore will arguably set the framework within which future development decisions are made – bringing the proposal within the realm of being a plan that would fall under the SEA requirements.

The public element of SEA is important, not only in ensuring that proposals such as the Expressway are brought forward in a way that is clearly compliant with the spirit of the existing European environmental directives, which we are assured are to be brought within the framework of UK legislation after the UK leaves the European Union, but also in ensuring that the widest possible access to environmental information is available to the decision maker when key infrastructure proposals are being considered. A recent example of the consequences of failing to carry out an SEA for such a project can be seen in phase 1 of the High Speed 2 proposals. No SEA was carried out and key information known to the public about the presence of protected species was not available to the government when the route was chosen. The consequences have been that potential major environmental impacts were not explored when the route was fixed, which are estimated to have increased the cost of the project by millions of pounds.

A legal challenge was brought to the lack of SEA for the HS2 phase 1 proposals. That challenge failed largely because the Courts considered the decision not to have been made until the Parliamentary process was completed, a process not necessary for the Expressway. The Wildlife Trusts, together with other parties, complained to the European Council. In July 2014 the Council stated that,

"*we remain of the view that large transport infrastructure developments such as this should be best addressed, in particular with regard to the question of alternatives, through the process foreseen in the SEA Directive (a matter which we will continue to raise with the UK authorities).*"

The Wildlife Trusts would also urge that a Habitats Regulations Assessment (HRA) is carried out to assess the potential impacts route development within the alternative corridors.

Net gain in biodiversity

We are greatly concerned that Highways England have not committed to achieving a net gain in biodiversity as a result of the Expressway project. The steer in planning policy is clearly for net gain rather than no net loss. To support that argument we attach in Appendix 1 a BBOWT note on net gain which sets out in detail key extracts from policy that clearly seek a net gain from development. In addition to the numerous extracts from the NPPF highlighted in Appendix 1 we draw particular attention to the following:

The recent Natural England review of HS2 No Net Loss metric stated: *"10.35 The NPPF requires development to achieve a net gain where possible. Natural England advises that in applying this national policy and conforming to international standards, it should be assumed that achieving a net gain is possible, unless there are clear justifications as to why it is not possible. If biodiversity declines are to be reversed, a net gain approach needs to be embedded as standard practice.*

Recommendation: 10.36 It is recommended that for Phase 2 the metric should be applied for the purpose of meeting a net gain objective in order to fully accord with national policy, rather than simply aiming to achieve NNL [No Net Loss]*."*

The recent CIEEM CIRIA IEMA net gain guidance indicates how industry is moving increasingly towards "net gain", giving further evidence that seeking net gain for the Expressway would be the most appropriate approach (https://www.cieem.net/biodiversity-net-gain-principles-and-guidance-for-uk-construction-and-developments).

The BBOWT note on net gain was written before several recent developments with respect to net gain in biodiversity. The requirement of net gain is further supported by a number of recent guidance documents and reports:

1. The revised NPPF: The draft text for the revised NPPF has been released for consultation and includes a requirement for minimising impacts and for providing a net gain in biodiversity by establishing coherent ecological networks that are more resilient to current and future pressures (para 168).

2. The National Infrastructure Commission (NIC) Partnering for Prosperity report (https://www.nic.org.uk/wp-content/uploads/Partnering-for-Prosperty.pdf) outlines a number of measures in recommendation 3 of how government and local authorities should work together to "*put in place an independent design panel for East West Rail,*[and] *the Expressway……. with a view to:……..achieving net gains in biodiversity and natural capital across the arc. …"* On page 53 the report also requires government and local authorities to work together to ensure that "*… new settlements and strategic infrastructure, including new elements of the East West Rail and the Oxford-Cambridge Expressway are planned, developed and strategically linked with each other and investment in green infrastructure to achieve net gains in biodiversity and natural capital."*

3. The recently published Government 25 Year Environment Plan includes a commitment by the government to "*Embed an 'environmental net gain' principle for development, including housing and infrastructure."* The Plan goes onto say that this should be done through partnership working between local planning authorities and developers "*… to mainstream the use of existing biodiversity net gain approaches within the planning system …".*

Net gain in biodiversity should be demonstrated in a measurable way, for example by using the DEFRA biodiversity accounting metric or another accepted metric derived from it. Such an approach is supported by the new draft NPPF (para 172) but also by best practice guidance and other strategic projects. For example EW Rail is pursuing a net gain in biodiversity, demonstrated through the use of a biodiversity accounting metric, and The Wildlife Trusts urge Highways England to do the same with regard to the Expressway.

Related to this we consider it extremely important that any development of this scale and impact is accompanied by a green infrastructure plan that reflects the magnitude of the impact. If this development was found to be acceptable it would need to be accompanied by a vision for biodiversity and green infrastructure that matches the economic ambitions and creates large swathes of connected high quality habitats for wildlife as well as open space for future residents. Adopting a net gain approach that is based on a piecemeal approach that does not follow a vision or comprehensive plan for the natural environment would not be able to deliver a true net gain as required by policy.

To ensure a net gain in biodiversity Highways England should pursue an approach that:

- minimises impacts on designated sites (both statutory and non-statutory sites, priority habitats, protected, priority and notable species, and locally agreed ecological networks (e.g. BOAs/CTAs) by choosing a route corridor which avoids these impacts;
- assesses, using a metric derived from the Defra biodiversity accounting metric, the existing biodiversity value of all land to be impacted;
- presents ambitious plans for large-scale habitat creation to a) compensate for impacts and b) provide additional habitat creation to ensure a net gain in biodiversity of, we would suggest, at least 20% using the metric;
- negotiates such habitat creation with established nature conservation organisations so that land on which compensation is provided is purchased and managed in perpetuity by such organisations to create large-scale nature reserves. Only in this way can it be ensured that any net gain from the project will be in place for as long as the Expressway is in place.
- ensures that habitat creation takes place in areas where it will be of most benefit by contributing to existing ecological networks.

Ecological networks

Wildlife of important habitats such as that found on Sites of Special Scientific Interest (SSSI) and Local Wildlife Sites (LWS) cannot survive indefinitely in isolation, but needs to be part of a wider network of habitats connected at a landscape scale.

In line with the NPPF (para. 117) and the Lawton principles "*more, bigger, better and joined"* landscape-scale areas have been identified in Oxfordshire, Buckinghamshire and Bedfordshire to focus nature conservation efforts. In Oxfordshire these ecological networks are called Conservation Target Areas (CTAs), Biodiversity Opportunity Areas (BOAs) in Buckinghamshire and the Biodiversity Opportunity Network (BON) in Bedfordshire.
As well as identifying areas with concentrations of international, national and locally designated sites, Priority Habitats and Priority Species, ecological network boundaries include surrounding land which can buffer and link areas thereby creating important larger and better connected landscapes.

They identify some of the most important areas for wildlife conservation, where targeted conservation action will have the greatest benefit. They provide a focus for coordinated delivery of biodiversity work, agri-environment schemes and biodiversity enhancements through the planning system. The respective maps show where the greatest gains can be made from habitat enhancement, restoration and creation, as these areas offer the best opportunities for establishing large habitat areas and/or networks of wildlife habitats.

Consideration should in all cases be given to ensuring that any development within an Ecological Network increases connectivity of wildlife habitats within target areas and results in a net gain for biodiversity. Biodiversity targets identified in the BOA/CTA/ BON statements incorporate, where appropriate, targets for Priority Habitat. However, not all targets are easily defined spatially, and the maps and statements should be read alongside relevant action plans that exist at a local and county level (this may include Local Authority Biodiversity and/or Green Infrastructure strategies, conservation strategies such as The Wildlife Trusts' Living Landscapes and RSPB Futurescapes or AONB management plans, or Local Plans for specific strategic site policies relating to CTA/BOAs).

More information on these landscape scale areas can be found under:

Conservation Target Areas (CTAs) - Oxfordshire:
https://www.wildoxfordshire.org.uk/biodiversity/conservation-target-areas/

Biodiversity Opportunity Areas (BOA**s***)* – Buckinghamshire:
http://www.buckinghamshirepartnership.gov.uk/biodiversity/biodiversity-opportunity-areas/

Biodiversity Opportunity Networks (BONs) – Bedfordshire:

http://www.bedscape.org.uk/BRMC/newsite/docs/bedslife/rebuild/Rebuilding%20Biodiversity%20in%20Bedford%20Borough.pdf; and

http://www.bedscape.org.uk/BRMC/newsite/docs/bedslife/rebuild/Rebuilding%20biodiversity%20in%20South%20Beds%20&%20Luton_FINAL.pdf.

In addition, The Wildlife Trusts have developed a 'Living Landscapes' approach to rebuild biodiversity on a landscape scale. In these areas the Wildlife Trusts are targeting landscape-scale conservation efforts and working with partners to secure nature's recovery. In recognition of the exceptional biodiversity value of the Bernwood / Ray area, BBOWT have

recently begun taking forward a Bernwood Forest and Ray Valley Living Landscape. To find out more about Wildlife Trust Living Landscapes in general see http://www.wildlifetrusts.org/living-landscape.

It is no coincidence that the best areas for habitat creation are mostly the same as the ones that are also of most concern in terms of impact on biodiversity. In north and central Buckinghamshire for instance, the areas that we consider the most important for habitat creation and restoration are Bernwood and the Upper Ray Valley, where the existing richest habitats are and where most benefit can be gained from linking these habitats to form stronger ecological networks. In Buckinghamshire, the Bernwood/Ray areas are equalled only by the Chilterns, in terms of their biological diversity.

The creation of such ecological networks follows the principles of the Lawton Report "more, bigger, better, joined" (https://www.gov.uk/government/news/making-space-for-nature-a-review-of-englands-wildlife-sites-published-today), commissioned by the government to inform the Natural Environment White Paper (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/228842/8082.pdf),.

Putting the Expressway route through these areas would not only have an overwhelmingly serious impact on their existing wildlife, it would also, through the impact of both the road and the likely related growth corridor development, make it no longer possible to achieve the vision of so many organisations and people for restoring biodiversity in these prime locations. These are also the locations where any compensation through biodiversity offsetting for developments in the growth corridor would be best located to achieve the aims for restoring nature.

5. Corridor specific comments:

All corridor options

As outlined above, the information provided as part of this consultation is unspecific and high level leaving a lot of room for interpretation. Following the recent Strategic Environment workshop (23rd March 2018) the Wildlife Trusts were kindly given the latest corridor information in a format that allows it to be viewed on GIS.

To inform this response the Wildlife Trusts have overlayed the corridor information with the data they hold on designated sites. The following maps provide an overview of the route corridors in relation to nature conservation sites. Species information has not been analysed but priority species are mentioned where they are known to present a key conservation interest.

Determining the impact of the proposed corridors on designated sites comprise a high level assessment that should be seen as a first step in determining the sensitivity of the route corridors and, related to that, the level of risk the Expressway and related development might cause to wildlife and the natural environment in the respective corridors. Whilst the

designated areas are key areas for nature conservation interest it does not mean that no conservation interest exists outside these areas. The information this response provides can therefore only be seen as a first step in assessing potential impacts on biodiversity and should be complimented by more detailed species information and survey data.

The following information is included on the maps:

- Special Areas for Conservation (SAC): sites of national and international importance for nature conservation;
- Special Sites of Scientific Interest (SSSI): sites of national importance of nature conservation;
- Local Wildlife Sites (LWS): sites of local importance for nature conservation;
- Ancient Woodland (AW): woodlands that have existed since 1600AD.
- Nature Reserves: the map shows two types of nature reserves, those managed by the Royal Society for the Protection of Birds (RSPB) and those managed by two of the Wildlife Trusts (BBOWT and WTBCN).
- Ecological Networks: these include landscape-scale areas for conservation. In Oxfordshire these are called Conservation Target Areas (CTA) whilst in Buckinghamshire they are called Biodiversity Opportunity Areas (BOA). More information on Ecological networks is provided under the heading Ecological Networks above.

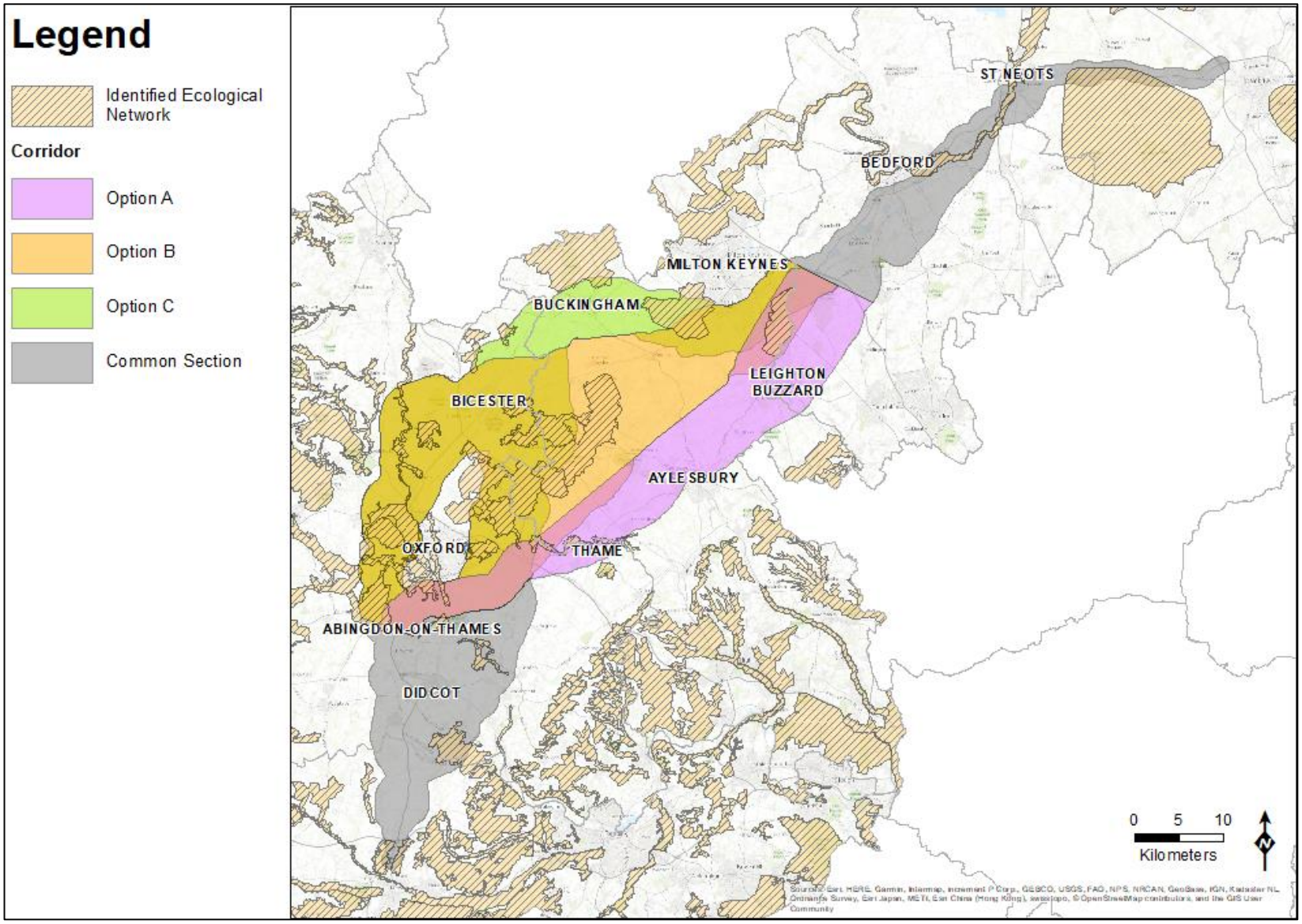
Unfortunately this mapping does not include the LWS data for Bedfordshire and Cambridgeshire due to licensing issues. The number of LWS affected by the Expressway might therefore be greater than stated.

In addition to the mapping The Wildlife Trusts have extracted valuable data of how many statutory and non-statutory sites might be affected by the respective route corridors. This information is provided in the summary towards the end of this consultation response. Care has to be taken when interpreting this data as many designations are not mutually exclusive, eg a SAC will also be a SSSI but might also be designated as an AW and could be located in a CTA/BOA. Please note also that the LWS data for Bedfordshire and Cambridgeshire are not included in the statistics.

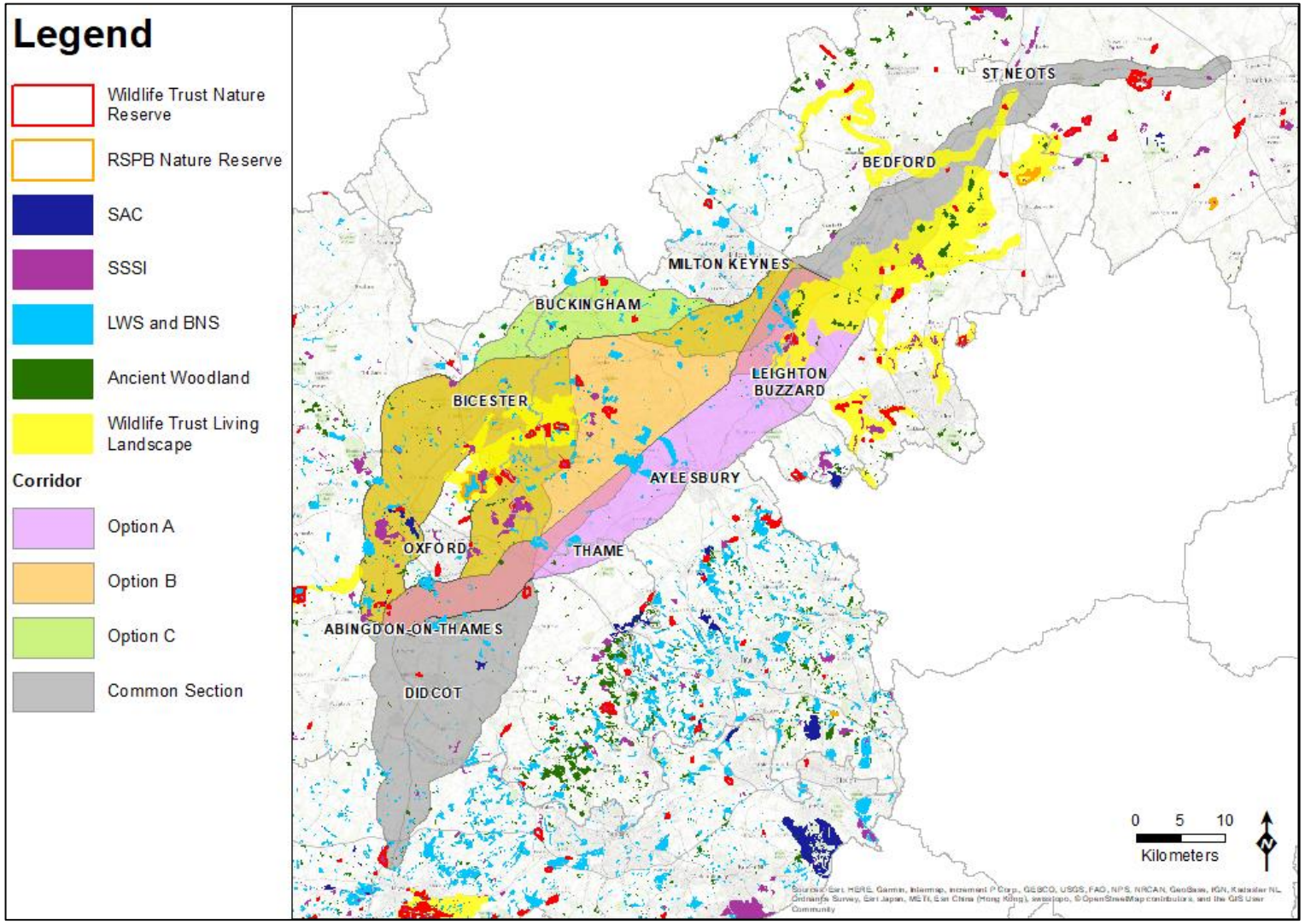
A further analysis was carried out assessing the potential effects on priority habitats for each road corridor. For this analysis publicly available priority habitat information from Natural England was used. Priority habitats that were found present in the area are:

- Coastal and floodplain grazing marsh
- Deciduous woodland
- Good quality semi-improved grassland
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland heathland

- Lowland meadows
- Purple moor grass and rush pastures
- Reedbeds
- Traditional orchard



Map 1: All route corridors shown in the context of Ecological Networks.



Map 2: All route corridors shown in the context of statutory and non-statutory nature designation sites. Please note that the map does not show the locally designated sites that exist for Bedfordshire Cambridgeshire and Northamptonshire due to licensing issues.

Common areas ('grey areas')

The areas that are common to all corridors, shown in grey, comprise large areas which even on their own have the potential to give rise to considerable ecological concerns. The diagram showing the overlay of the different route corridors also highlights that it is not only the grey areas that all corridor options have in common but also the dark pink areas, increasing these areas even further (see figure 1 and 2 above)

Designated sites:

The grey areas, north and south, (as submitted as a GIS layer) affect 11 SSSI, 1 SAC, 3 BBOWT Nature reserves, 4 WTBCN Nature Reserves, 130 Ancient Woodlands, 69 LWS, 5 BOA (SE) and 2 BCN Ecological Networks. These equate to 263 ha of SSSI, 575 ha of LWS/ and result in 3733 ha of priority habitat being affected. All the designated sites are either fully or partially located in the route corridor.

Common part of corridor to SW of A, B and C

At the southern end the corridor seems to largely follow the A34 but it gets wider further north, over 18km wide towards the Oxford/Abingdon end. This area, in particular towards its northern end and near the conurbations of Abingdon, Didcot and Wallingford is already subject to large developments to meet the existing housing needs for Vale of White Horse DC, South Oxfordshire DC and Oxford City DC and therefore significantly under pressure

In the southern part this includes Wittenham Clumps SAC, BBOWT nature reserve Wells Farm, CTA Thames Radley to Abingdon, CTA Oxford Heights West, CTA Thames and Cherwell at Oxford CTA are affected.

The Wittenham Clumps, two hills crowned by trees, are one of South Oxfordshire's most iconic landmarks, offering views across the surrounding countryside. They are not only an important open space resource for residents and visitors alike but also internationally recognised for nature conservation interest. The main interest is the site's large population of great crested newts but it also contains many other important habitats and species such as areas of Ancient Woodland and priority grasslands. The site is complimented by a number of Local Wildlife Sites, which are mostly associated with the floodplains of the River Thames. Adverse effects on the SAC and nearby designated sites and habitats will need to be avoided. An HRA is required with regard to the SAC.

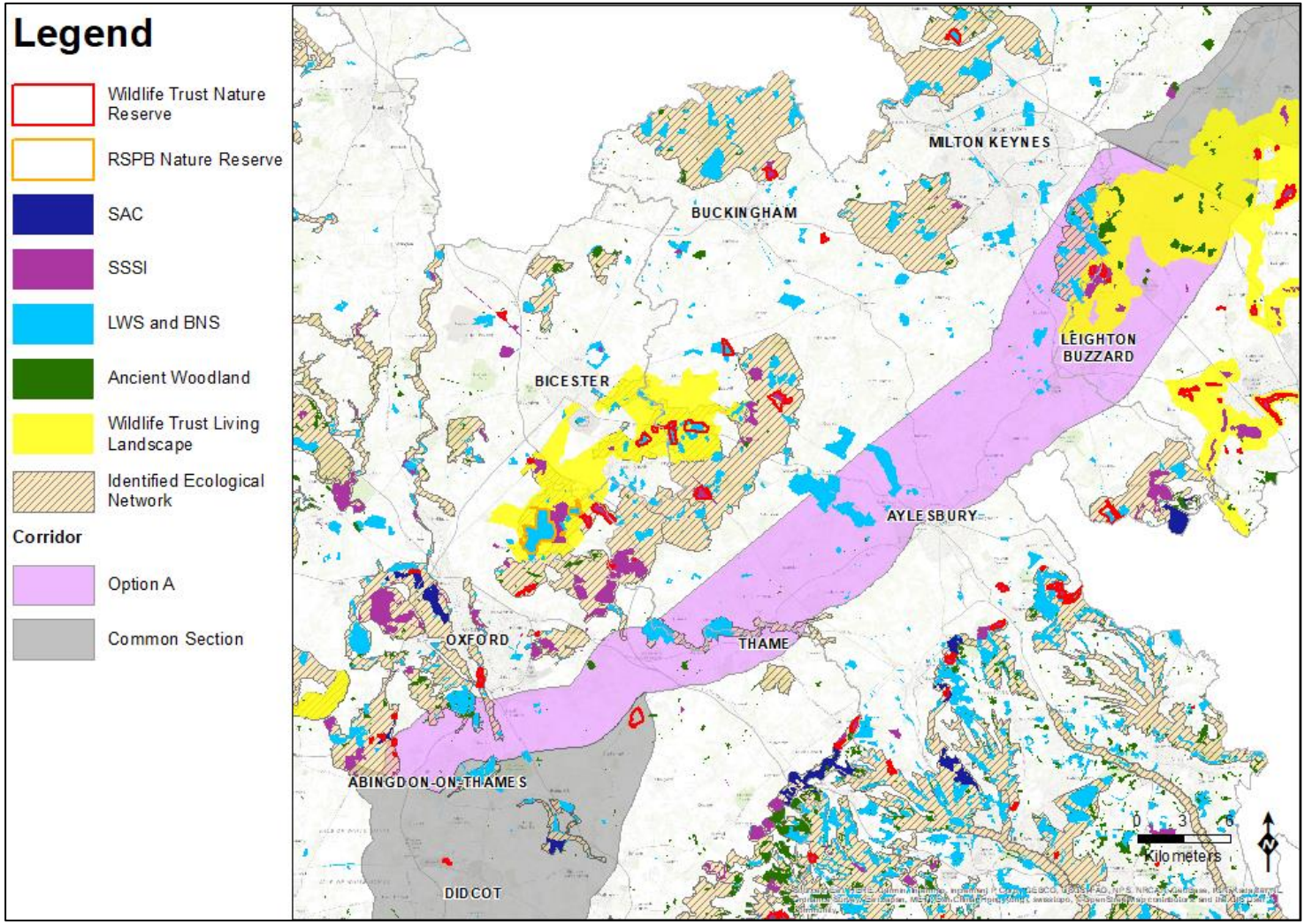
Wells Farm near Little Milton is a Wildlife Trust nature reserve (BBOWT) and a key site for tending to the Trusts livestock during the winter months. The site comprises considerable nature conservation interest but is also essential for the operation of BBOWT, the local Wildlife Trust.

Common part of corridor to NE of A, B and C

The north-eastern section of the Expressway, from Milton Keynes to Cambridge, follows existing roads, and this consultation does not relate to alternative routes within the north eastern section. However, the Expressway development will give rise to ecological impacts on receptors within the route corridor in this section. Indirect impacts within the corridor will

come from increases in air pollution, a key concern for many priority habitats, noise and potentially light. Direct impacts may arise from construction work to bring the existing route up to the Expressway standard, and from increased ecological fragmentation. Although, given the lack of alternatives for the north eastern section, these impacts will not affect the selection of the broad corridor for the Expressway, as they will arise whichever corridor is chosen, they should be taken into account when considering the actions needed to develop a true net gain for biodiversity from the development of the proposals (see below).

Corridor A



Map 3: Corridor A in the context of designated sites, Ecological Networks and Living Landscapes.

Corridor A

Key features under threat of impact if Corridor A was chosen:

Designated sites:

Corridor A c affects 17 SSSIs, 1 SAC, 2 BBOWT Nature reserves, 3 WTBCN Nature reserves, 151 Ancient Woodlands, 63 BNSs, 50 LWS and 10 BOAs/CTAs. These equate to 265 ha of SSSI, 2063 ha of LWS/BNS and result in 3547 ha of priority habitat being affected. All the designated sites are either fully or partially located in the route corridor.

Abingdon to Thame

This area might not contain as many statutory and non-statutory nature conservation designations however it still comprises considerable nature conservation interest associated with stream corridors and grassland habitats. A number of European protected species such as otter as well as a rich assemblage of birds have been recorded in the area that would be adversely affected by any road and associated development.

Thame Valley

One of the key areas is the Thame Valley BOA, which is the focus of considerable nature conservation interest and effort. The land either side of the River Thame is rich in floodplain grazing marsh which plays host to a wide diversity of breeding and wintering bird species, many of them red-listed priority species. These include lapwing and curlew amongst many other declining bird species. If this corridor is chosen then the route should be kept well away from the River Thame wherever possible.

The Chilterns AONB

If Corridor A is adopted then it is likely to lead to increased development in Thame, Haddenham and Aylesbury. This would lead to increased recreational pressure on the many designated sites for wildlife in the Chilterns within numerous BOAs, including numerous SSSIs, Aston Rowant SAC, Chilterns Beechwoods SAC, so there would be a need for the creation of significant areas of wildlife habitat associated with such development to provide alternative green spaces for recreation.

Ouzel Valley

All three of the corridors cross the River Ouzel BOA to the SE of Milton Keynes. The river and its associated habitats either side must be taken into account in the exact route choice following corridor selection.

Greensand Ridge

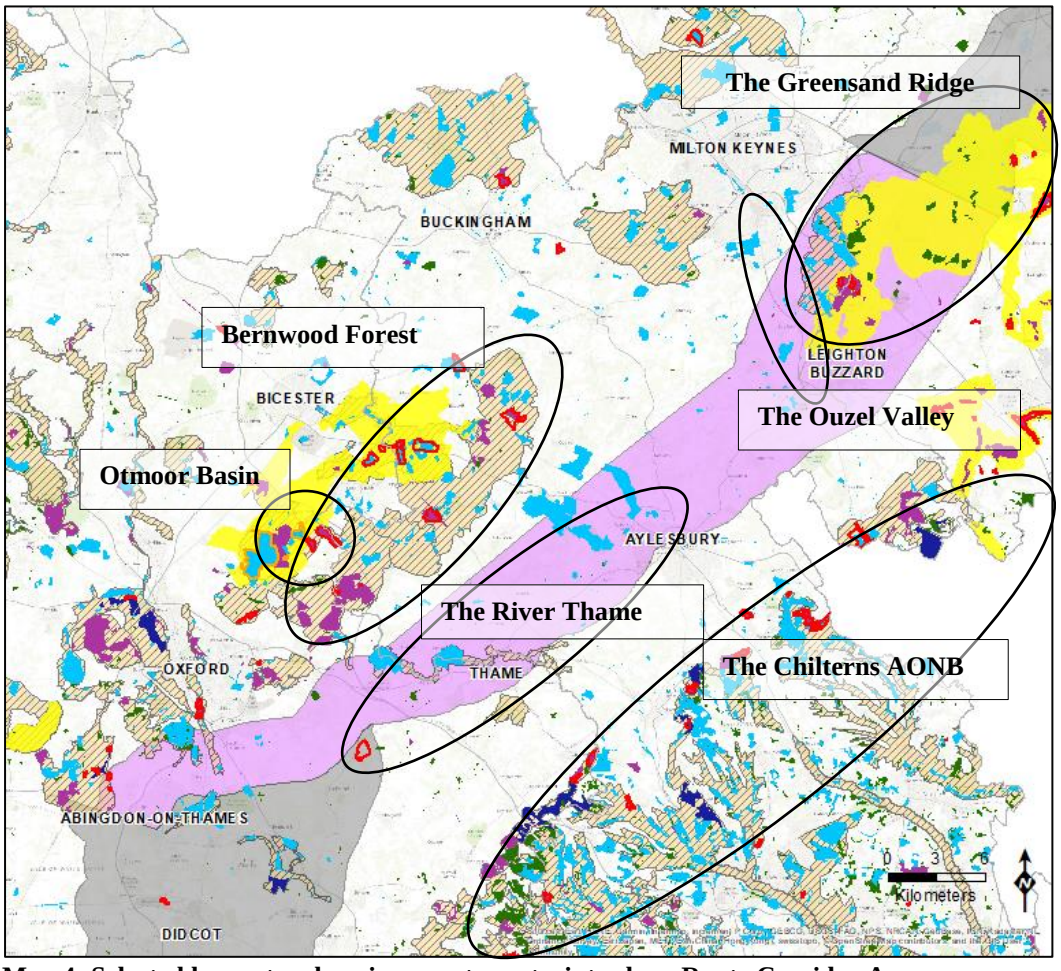
The Greensand Ridge has been designated as a Nature Improvement Area in recognition of the existing network of wildlife rich sites, particularly heathlands, grasslands and woodlands. Corridor A as it crosses the Ridge includes two areas which are particular hotspots for biodiversity within Bedfordshire. The first is the group of Sites of Special Scientific Interest (SSSI) and National Nature Reserve at King's and Baker's Woods and Heath, along with the surrounding woodlands, grasslands and heathlands. In acknowledgment of its importance, this complex includes a substantial number of designated

sites as well as Rushmere Country Park, a popular public open space. The second hotspot is where this Corridor moves towards the M1 around Woburn. It includes both the parkland and woodland within the Woburn Estate and the woodlands to the west which contain Wavendon Heath Ponds SSSI. It is difficult to see where this area could accommodate a major new road without causing substantial habitat loss and the severing of biodiversity networks within the Nature Improvement Area.

Biodiversity Opportunity Areas / Conservation Target Areas

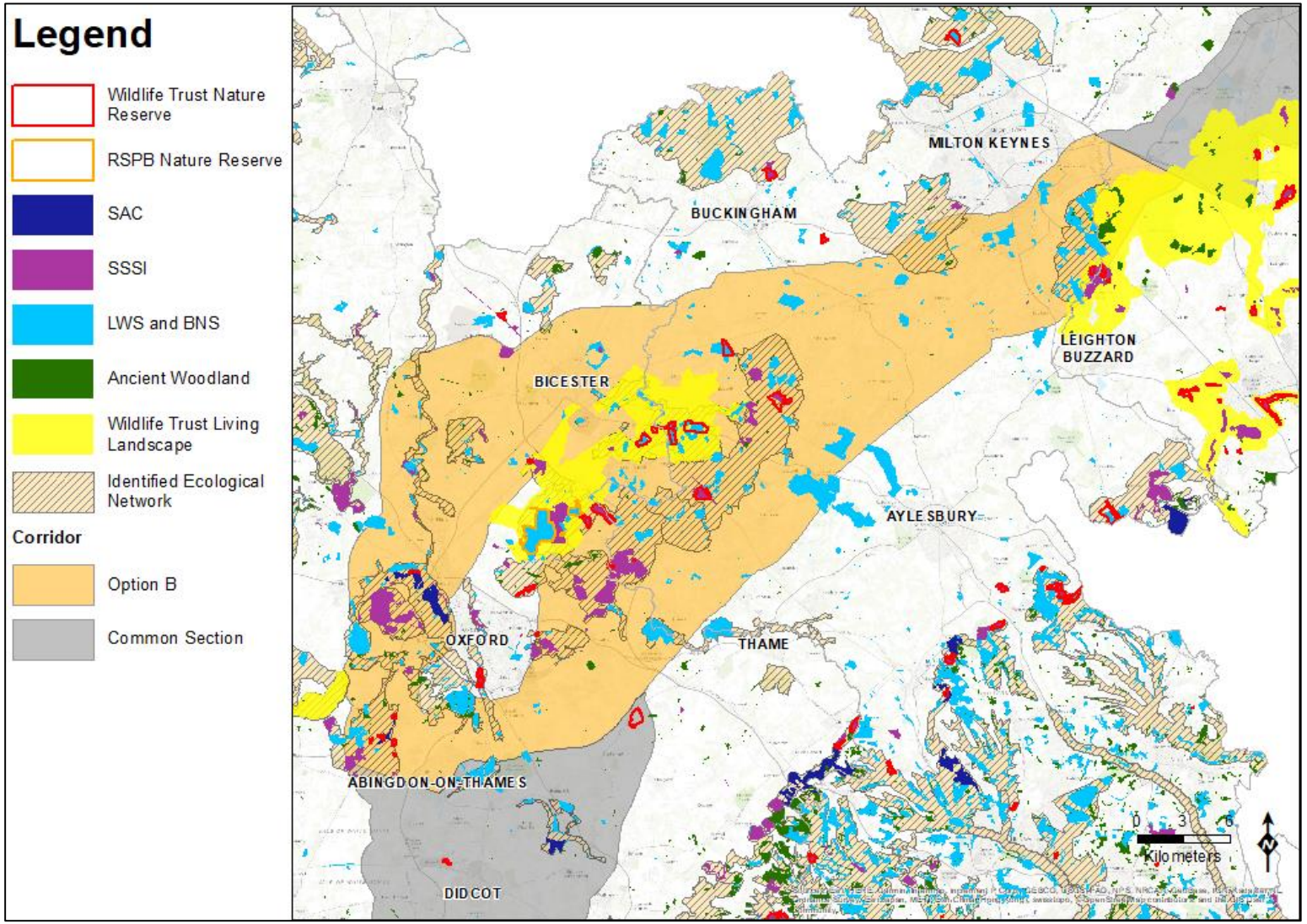
In Oxfordshire, corridor A has the potential to adversely impact on the Thames Radley to Abingdon CTA, Thames and Cherwell at Oxford CTA and the Oxford Heights West CTA. In Buckinghamshire, the Thame Valley BOA and the Greensand Ridge BOA lie within Corridor A.

Conclusion: The Wildlife Trusts have serious concerns over Corridor A, however, this Corridor indicates fewer obvious ecological constraints than Corridor B.



Map 4: Selected key natural environment constraints along Route Corridor A.

Corridor B



Map 5: Corridor B in the context of designated sites, Ecological Networks and Living Landscapes.

Corridor B

Key features under threat of impact if Corridor B was chosen:

Designated sites:

Corridor B includes 51 SSSIs, 3 SACs, 17 BBOWT Nature Reserves, 2 WTBCN Nature Reserves, 1 RSPB Nature Reserve, 418 Ancient Woodlands, 111 BNSs, 234 LWSs and 49 BOAs/CTA. These equate to 2353 ha of SSSIs, 4302 ha of LWS/ BNS and will result in 8474 ha of priority habitat being affected. All the designated sites are either fully or partially located in the route corridor. Please see tables 1-3 in the Conclusion chapter for more detail.

Corridor options West of Oxford (Oxford Sub-options S1)

Oxford Meadows SAC

In Oxfordshire Corridor B includes several options within itself suggesting that the Expressway and associated growth could pass Oxford either on the West side or on the East side. Both options leave a lot of room for interpretation and raise significant ecological concerns.

A western route (S1) could potentially comprise the widening of the A34, although the latest diagram does not seem to suggest this. A widening of the A34 would result in ecological impacts through land-take but also increased traffic volumes which in turn would give rise to indirect effect such as increase in pollutants which would adversely impact on sensitive grassland habitats such as the Oxford Meadows SAC.

Oxford Meadows SAC is of international importance and includes vegetation communities that are perhaps unique in reflecting the influence of long-term grazing and hay-cutting on lowland hay meadows. The site has benefited from the survival of traditional management, which has been undertaken for several centuries, and so exhibits good conservation of structure and function. Port Meadow is the largest of only three known sites in the UK for creeping marshwort *Apium repens*.

The objective for the SAC as stated in Natural England's citations is to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) and *Apium repens;* Creeping marshwort.

It is hard to imagine that such highway works coupled with increased traffic volumes would not inevitably cause adverse effects on the Oxford Meadows SAC due to increased pollution and nutrient deposition. However, any development potentially impacting on the site will need to be subject to a Habitats Regulation Assessment (HRA) to assess the significance of any impacts. Any development should follow the mitigation hierarchy and should avoid impacts in the first place and only seek mitigation or, as a last resort, compensation if no alternative exists.

In addition to the SAC other key ecological areas affected by a proposed widening would be Bagley Wood AW / LWS, Radley Large Wood AW / LWS, as well as several LWSs adjacent or a short distance to the route and the Farmoor and Thames CTA

Cothill Fen / Wytham Woods

The western section of Corridor B (S1) seems to suggest it will bypass Oxford to the West by creating a new road through the Cothill Fen / Wytham Woods area. Cothill Fen SAC is of international importance and supports outstanding examples of nationally rare calcareous fen and moss-rich mire communities together with associated wetland habitats. It is one of a number of nationally important sites where the vegetation of the area over the past ten millennia can be interpreted from peat samples. Cothill Fen exhibits succession from open water to fen, scrub and carr, together with an adjacent area of ancient woodland. Plant distribution varies in conjunction with differences in water table, canopy cover, peat depth, soils and historical factors such as peat cutting and attempts at drainage. Over 330 vascular plants have been recorded, including species which are uncommon in southern England, together with many uncommon invertebrates.

The site is internationally designated as an SAC for its rare alkaline fens and alder woodland habitats, both of which are sensitive to hydrological changes in flow and water quality. This is also reflected in the Site Improvement Plan for Cothill Fen, which highlights hydrological changes; water pollution; and air pollution. (http://publications.naturalengland.org.uk/publication/6482436405854208?category=4981459005734912)

Due to a combination of unusual geology and topography combined with sections of minimal disturbance the area contains some very significant and sensitive habitats that support much specialist wildlife. These habitats and species are also a key driver for a number of local designations such as LWSs, Wildlife Trust (BBOWT) nature reserves and land designations in the wider area, which in turn have contributed to the creation of the 'Oxford Heights West' Conservation Target Area (CTA).

Wytham Woods is a large complex of ancient woodland, wood pasture, common land and old limestone grassland on a variety of soils owned and maintained by the University of Oxford. It is designated as Ancient Woodland and as SSSI and is one of the most researched pieces of woodland in the world. It is exceptionally rich in flora and fauna, with over 500 species of plants, a wealth of woodland habitats, and 800 species of butterflies and moths.

Due to the rich ensemble of designated sites and habitats the majority of the area west of Oxford is designated by a number of CTAs such as Wytham Hill CTA, Oxford Meadows and Farmoor CTA, West Oxford Heights CTA.

Routing the Expressway and associated development through this hydrologically and ecologically sensitive area of local, national and international importance would be catastrophic for this area and The Wildlife Trusts would strongly oppose such a corridor option.

Route south of Oxford (Oxford Sub-options S2 & S3)
The eastern route corridor for option B is shown to run along the southern edge of Oxford past Shotover, Wheatley continuing in a north-easterly direction. This routing has the potential to impact on a number of nature conservation designations at the southern edge of Oxford, namely Bagley Wood AW/ LWS, Sandford Brake LWS, Brasenose Wood and Shotover Hill SSSI.

Brasenose Wood has a well defined coppice-with-standards structure and is one of the few English woods which are still actively managed by this traditional method. The greater part of the wood is an ancient remnant of Shotover Forest with a documented history dating back to the thirteenth century. The flora in the wood is exceptionally rich for a wood of this size with 221 recorded vascular plant species including 46 which are characteristic of ancient woodland.

The SSSI forms part of the larger Shotover Country Park, which offers views across Oxford and is a popular recreational site for residents and visitors alike. The area is also designated as Shotover CTA.

Bernwood Forest (in the vicinity in the Stanton St John, Horton-cum-Studley, Boarstall and Oakley area)
The area East of Oxford is characterised by a mosaic of woodlands, meadows and agricultural fields, which form part of the former Royal Hunting Forest of Bernwood. It includes a complex of numerous ancient woodlands including Shabbington Wood (SSSI - Forestry Commission) and Whitecross Green Wood (SSSI / Wildlife Trust nature reserve). It also includes lowland meadow priority habitat including Bernwood Meadows (SSSI / Wildlife Trust nature reserve) and Asham Meads (SSSI / Wildlife Trust nature reserve). These are MG4/MG5 meadows and thus the issue regarding SSSI designation dealt with in the section of the Ray Valley, and in Appendix 2 below, also applies to MG5 meadows.

The area is designated as the Bernwood CTA/BOA, which crosses the Oxfordshire-Buckinghamshire border.

Bernwood Forest in the Brill area
This is another part of the ancient Royal Hunting Forest of Bernwood and within Bernwood BOA. It includes a complex of numerous ancient woodlands including Rushbeds Wood (SSSI – BBOWT nature reserve) and Chinkwell Wood (LWS). It also includes areas of lowland meadows and calcareous grassland priority habitats including Brill Common LWS.

Otmoor Basin (in the vicinity of Horton-cum-Studley, Murcott and Charlton-on-Otmoor)
This area is host to a large wetland RSPB nature reserve, Otmoor, which is home to a rich ensemble of priority habitats (floodplain grazing marsh, reedbed, ponds, hedgerows, scrub) which supports valuable breeding populations of breeding waders that are declining considerably including lapwing, curlew and snipe. Otmoor is also home to numerous other red-listed birds of conservation concern and a well-known and dazzlingly impressive starling murmuration, bringing visitors to the area. The Otmoor Basin is host to an SSSI and Local Wildlife Sites and is a CTA. Like Bernwood described below it has exceptionally high quality hedgerows which are host to numerous species.

As a result of the rich wildlife described in the above two sections, The Wildlife Trusts and RSPB have been working together for many years on a combined Living Landscape/Futurescape for the Otmoor/Ray area, encouraging landscape scale conservation to safeguard existing habitat and create new habitat. See http://www.bbowt.org.uk/what-we-do/living-landscapes/upper-river-ray-floodplain and https://www.rspb.org.uk/our-work/conservation/landscape-scale-conservation/sites/upper-thames-river-valleys/ for more details.

Upper Ray Valley (in the vicinity of Ambrosden, Blackthorn, Grendon Underwood and Ludgershall)

Host to numerous Wildlife Trust nature reserves, the Upper Ray Valley has large areas of floodplain meadow habitat (known technically as MG4 habitat) of which there is only 1500ha remaining in the UK[1]. A type of traditional hay meadow that forms in river floodplains, it is one of our rarest habitats and every summer plays host to a dazzling array of flowers, some of them unique to the habitat, and associated insects and other animals. Across the UK it is estimated that we have lost 97% of our wildlife-rich meadows[2]. The Ray Valley is one of the last remaining strongholds of floodplain meadow habitat. The local Wildlife Trust (BBOWT) nature reserves within the Ray Valley alone host a significant proportion of the remaining MG4 floodplain meadow habitat in the UK and there are substantial areas in the Ray Valley outside of the Wildlife Trust reserves. There are numerous designated sites including SSSIs and LWSs. The Ray Valley sites are of similar quality to the nearby Oxford Meadows floodplain meadow habitat which have received European designation as an SAC.

In 2014 Natural England published a revision to Chapter 3 (Lowland Grasslands) of the Guidelines for the Selection of Biological SSSIs. Essentially, this document recognised that certain types of lowland grassland priority habitat (including the MG4 priority habitat referred to above) were now so rare and threatened that the standard SSSI protocols of selecting a sample of sites that meet SSSI standards were no longer appropriate and that "*all examples greater than 0.5 ha should be selected.*" BBOWT is currently working with Natural England with respect to taking forward an assessment of the value of the MG4/5 habitat in the Ray Valley and Bernwood areas with a view to potentially bringing forward a SSSI designation to cover a number of them. We consider that until Natural England provide advice on how such sites should be treated, the planning system should treat impacts on blocks of MG4/MG5 habitat greater than 0.5 ha in area on the basis that the site qualifies as a SSSI. Further details of the Revision to Chapter 3 are in Appendix 2.

The Centre for Ecology and Hydrology (CEH) have copies of a number of historic surveys of the grasslands in the area. We have seen them but are not at liberty to pass them on and if you wish to see them then we recommend approaching CEH direct for copies of these.

The Upper Ray is a BOA, and host to breeding waders such as curlew and lapwing which are declining rapidly in the UK and are red-listed Birds of Conservation Concern. The curlew in

[1] http://www.floodplainmeadows.org.uk/floodplain-meadow-technical-handbook
[2] https://www.theguardian.com/commentisfree/2015/may/18/losing-97-percent-britain-wildflower-meadows-matters-butterfly

particular is exceptionally intolerant of human disturbance and requires isolated undisturbed farmland in the area to breed. Like Bernwood described below, the Ray Valley has exceptionally high quality hedgerows which are host to numerous species.

Bernwood Forest (in the vicinity of Calvert, Charndon, Grendon Underwood, Quainton and Middle Claydon)

The Ancient Hunting Forest of Bernwood (see https://en.wikipedia.org/wiki/Bernwood_Forest) lies right in the heart of the Corridor B Expressway route zone. It is one of the most undisturbed and wildlife-rich areas of Buckinghamshire. It includes numerous areas of ancient woodland, an irreplaceable habitat, many of them designated as SSSIs, as well as species-rich grassland, open water, scrub and hedgerows. In recognition of the value of these woodlands BBOWT have recently been working on a Bernwood Forest project to enhance the wildlife value of some of these ancient woodlands.

The ancient woodlands in the vicinity of Calvert (including Sheephouse Wood, Finemere Wood, Grendon and Doddershall Wood and others) play host to an exceptionally varied and species-rich complex of bat populations (bats are European protected species). One bat species, the Bechstein's Bat is exceptionally rare in the UK, with an estimated population of only 1500 adults[3], and Bernwood plays host to one of the most northerly populations of the species in the UK. The Statement of Case submitted by BBOWT in relation to the FCC sidings on the HS2 route sets out a case in section 3 that the area should be designated at European level as an SAC (Special Area of Conservation) because of the exceptional value of the population of the rare Bechstein's Bat. This is attached in Appendix 3.

Bernwood is a BOA and is also host to numerous MG5 lowland meadows. The issue regarding SSSI designation dealt with in the section of the Ray Valley above, and in Appendix 1 below, also applies to MG5 meadows.

Along with the Ray Valley and Otmoor, Bernwood is host to some of the most biologically valuable ancient hedgerows in the UK. The hedgerows characteristic to the area include a very high % content of blackthorn (amply demonstrated by a drive along the quiet rural roads of Bernwood in early Spring to witness the stunning display of blackthorn flowers). As a result the Bernwood, Otmoor, Ray areas have become the UK stronghold for brown and black hairstreak butterflies which both require blackthorn to complete their life cycle. Both butterflies spread only slowly and are very vulnerable to loss of hedgerows containing their breeding colonies. Further details on these butterflies are attached in the form of a Butterfly Conservation document. In recognition of the value of the hedgerows in the area, BBOWT are working in partnership with Aylesbury Vale District Council on a Hedgerow Havens project aiming to restore hedgerows and other key features of the landscape in the Bernwood/Ray areas.

This zone also includes a complex of high biodiversity sites to the north of Calvert including BBOWT's Calvert Jubilee nature reserve, and Grebe Lake, both Local Wildlife Sites, and the neighbouring Calvert Brick Pits nature reserve.

[3] http://www.bats.org.uk/pages/bechsteins_bat_facts.html

Whaddon Chase, Claydon and Padbury Streams, and North Bucks Fens

These BOAs are to the south and west of Bletchley and contain wildlife rich ancient woodlands, fens, lowland meadows and streams.

Ouzel Valley

All three of the corridors cross the River Ouzel BOA to the SE of Milton Keynes. The river and its associated habitats either side must be taken into account in the exact route choice following corridor selection.

Greensand Ridge

The Greensand Ridge has been designated as a Nature Improvement Area in recognition of the existing network of wildlife rich sites, particularly heathlands, grasslands and woodlands. Corridor B includes part of two biodiversity hotspots within the Ridge. It includes the edge of the woodlands, grasslands and heathlands at King's and Baker's Woods and Heaths. In acknowledgment of its importance, this complex includes a substantial number of designated sites as well as Rushmere Country Park, a popular public open space. The second hotspot is where the corridor moves towards the M1 around Woburn. Here it includes the woodlands to the west of Woburn which contain Wavendon Heath Ponds SSSI. Any route within this corridor would need to avoid these biodiversity hotspots and maintain linkages to them from along the Ridge.

Biodiversity Opportunity Areas / Conservation Target Areas

Together the Bernwood/Otmoor/Ray areas are equalled only by the Chilterns, in Buckinghamshire, in terms of their biological diversity. Bernwood, Brill and Muswell Hill, the Ray, Whaddon Chase, Claydon and Padbury Streams, and North Bucks Fens have all been selected as Biodiversity Opportunity Areas in Buckinghamshire. Bernwood, Brill and Muswell Hill, Otmoor, and the Ray have all been selected as Conservation Target Areas (CTAs, equivalent to BOAs) in Oxfordshire.

Biodiversity Opportunity Areas (BOAs) identify the most important areas for wildlife conservation in Buckinghamshire, where targeted conservation action will have the greatest benefit. The main aim within BOAs is to restore biodiversity at a landscape scale through the maintenance, restoration and creation of priority habitats.

BBOWT Bernwood Forest and Ray Valley Living Landscape

We have already referred to the BBOWT/RSPB partnership in the Ray Valley. In recognition of the exceptional biodiversity value of the Bernwood / Ray area as described above, BBOWT have recently begun taking forward a Bernwood Forest and Ray Valley Living Landscape. To find out more about Wildlife Trust Living Landscapes in general see http://www.wildlifetrusts.org/living-landscape

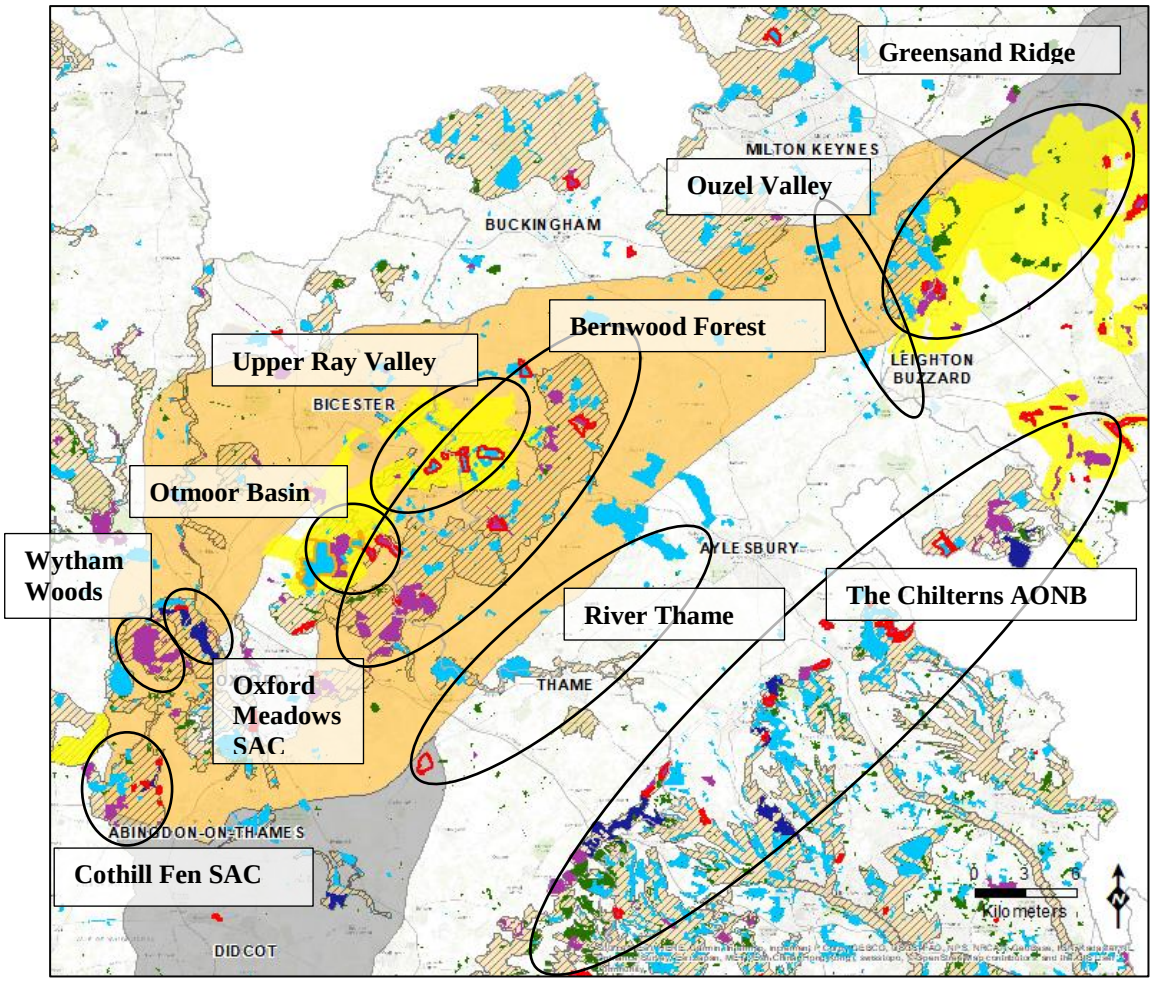
Ridge and Furrow grasslands

"Turning the Plough Midland open fields: landscape character and proposals for management" (David Hall - English Heritage Northamptonshire County Council) includes a map showing the location of townships with highest survival of ridge and furrow, and states: *"One or two of the sites should perhaps be proposed for World Heritage Sites because they*

represent the best examples of an agricultural system that dominated Northern Europe for a thousand years." Buckinghamshire had close to the greatest number of high survival areas for ridge and furrow grassland of any county, and of those eight areas, seven of them lie within Bernwood: Ludgershall, Dorton, Ashendon, Quainton, Hogshaw, North Marston, Creslow.

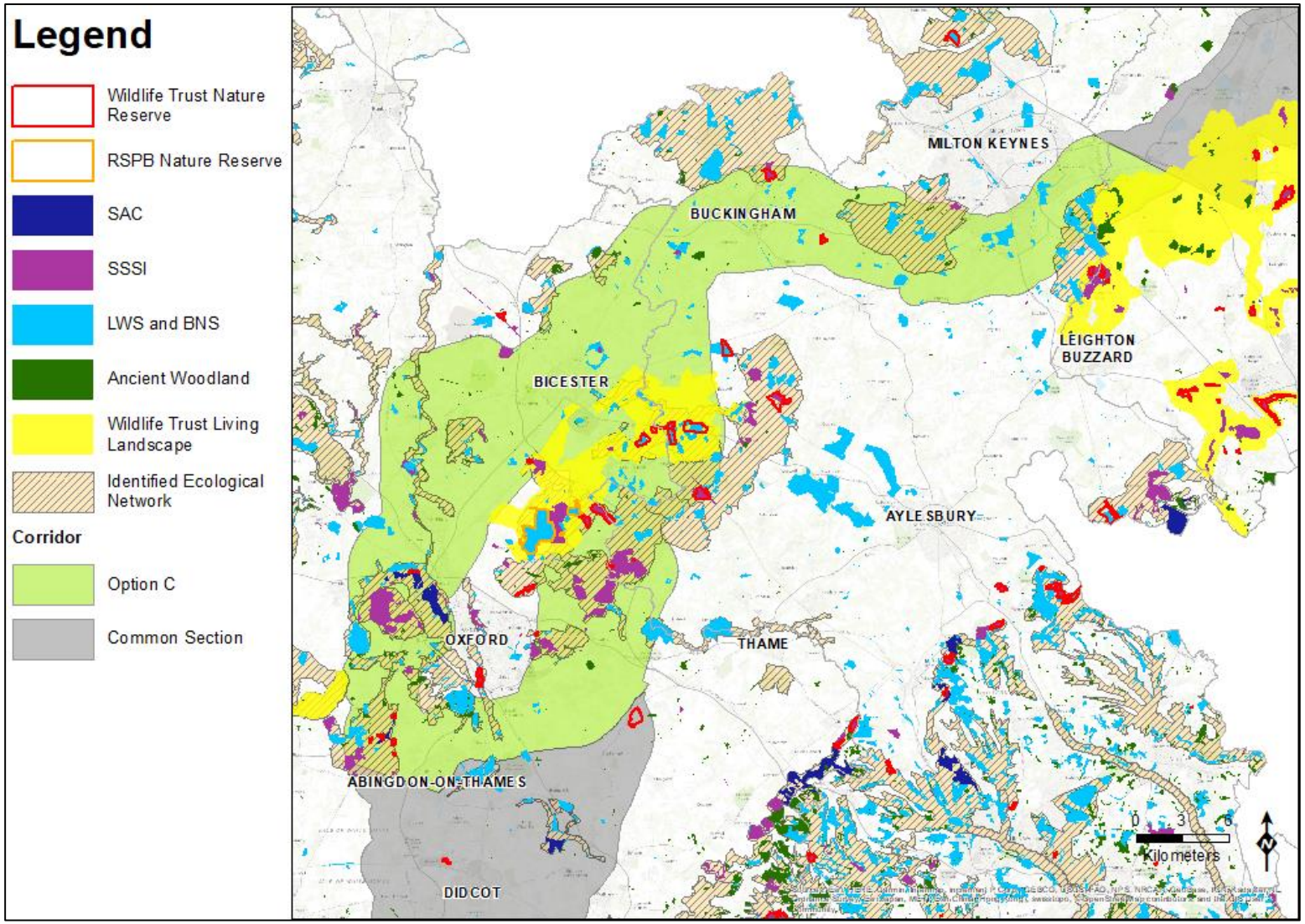
<u>Conclusion:</u>

The Wildlife Trusts have their most serious concerns about Corridor B and consider that it would not be possible to take the route within this corridor without exceptionally serious impacts on biodiversity. As such we consider that the Corridor B option should be discounted.



Map 6: Selected key natural environment constraints along Corridor B.

Corridor C



Map 7: Corridor C in the context of designated sites, Ecological Networks and Living Landscapes.

Corridor C

Key features under threat of impact if Corridor C was chosen:

Designated sites:

Corridor B includes 45 SSSIs, 3 SACs, 16 BBOWT Nature Reserves, 1 RSPB Nature Reserve, 391 Ancient Woodlands, 80 BNSs, 194 LWSs and 45 BOAs/CTA. These equate to 2032 ha of SSSIs, 3034 ha of LWS/ BNS and will result in 7399 ha of priority habitat being affected. All the designated sites are either fully or partially located in the route corridor. Please see tables 1-3 in the Conclusion chapter for more detail.

Corridor options West of Oxford (Oxford Sub-options S1)

Oxford Meadows SAC

In Oxfordshire Corridor C includes several options within itself suggesting that the Expressway and associated growth could pass Oxford either on the West side or on the East side. Both options leave a lot of room for interpretation and raise significant ecological concerns.

A western route (S1) could potentially comprise the widening of the A34, although the latest diagram does not seem to suggest this. A widening of the A34 would result in ecological impacts through landtake but also increased traffic volumes which in turn would give rise to indirect effect such as increase in pollutants which would adversely impact on sensitive grassland habitats such as the Oxford Meadows SAC.

Oxford Meadows SAC is of international importance and includes vegetation communities that are perhaps unique in reflecting the influence of long-term grazing and hay-cutting on lowland hay meadows. The site has benefited from the survival of traditional management, which has been undertaken for several centuries, and so exhibits good conservation of structure and function. Port Meadow is the largest of only three known sites in the UK for creeping marshwort *Apium repens*.

The objective for the SAC as stated in Natural England's citations is to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) and *Apium repens;* Creeping marshwort.

It is hard to imagine that such highway works coupled with increased traffic volumes would not inevitably cause adverse effects on the Oxford Meadows SAC due to increased pollution and nutrient deposition. However, any development potentially impacting of the site will need to be subject of a Habitats Regulation Assessment (HRA) to assess the significance of any impacts. Any development should follow the mitigation hierarchy and should avoid impacts in the first place and only seek mitigation or, as a last resort, compensation if no alternative exists.

In addition to the SAC other key ecological areas affected by a proposed widening would be Bagley Wood AW / LWS, Radley Large Wood AW / LWS, as well as several LWS adjacent or a short distance to the route and the Farmoor and Thames CTA.

Cothill Fen / Wytham Woods

The western section of Corridor C (S1) seems to suggest bypassing Oxford to the West by creating a new road through the Cothill Fen / Wytham Woods area. Cothill Fen SAC supports outstanding examples of nationally rare calcareous fen and moss-rich mire communities together with associated wetland habitats. It is one of a number of nationally important sites where the vegetation of the area over the past ten millennia can be interpreted from peat samples. Cothill Fen exhibits succession from open water to fen, scrub and carr, together with an adjacent area of ancient woodland. Plant distribution varies in conjunction with differences in water table, canopy cover, peat depth, soils and historical factors such as peat cutting and attempts at drainage. Over 330 vascular plants have been recorded, including species which are uncommon in southern England, together with many uncommon invertebrates.

The site is internationally designated as an SAC for its rare alkaline fens and alder woodland habitats, both of which are sensitive to hydrological changes in flow and water quality. This is also reflected in the Site Improvement Plan for Cothill Fen, which highlights hydrological changes; water pollution; and air pollution. (http://publications.naturalengland.org.uk/publication/6482436405854208?category=4981459005734912)

Due to a combination of unusual geology and topography combined with sections of minimal disturbance the area contains some very significant and sensitive habitats that support much specialist wildlife. These habitats and species are also a key driver for a number of local designations such as LWSs, BBOWT nature reserves and land designations in the wider area, which in turn have contributed to the creation of the 'Oxford Heights West' Conservation Target Area (CTA).

Wytham Woods is a large complex of ancient woodland, wood pasture, common land and old limestone grassland on a variety of soils owned and maintained by the University of Oxford. It is designated as Ancient Woodland and as SSSI and is one of the most researched pieces of woodland in the world. It is exceptionally rich in flora and fauna, with over 500 species of plants, a wealth of woodland habitats, and 800 species of butterflies and moths.

Due to the rich ensemble of designated sites and habitats the majority of the area west of Oxford has a number of CTA's such as Wytham Hill CTA, Oxford Meadows and Farmoor CTA, West Oxford Heights CTA.

Routing the Expressway and associated development through this hydrologically and ecologically sensitive area of local, national and international importance would be catastrophic for this area and The Wildlife Trusts strongly oppose this corridor option.

Corridor south of Oxford (Oxford Sub-options S2 & S3)

The eastern route corridor for option B is shown to run along the southern edge of Oxford past Shotover, Wheatley continuing in a north-easterly direction. This routing has the potential to impact on a number of nature conservation designations at the southern edge of Oxford namely Bagley Wood AW/ LWS, Sandford Brake LWS Brasenose Wood and Shotover Hill SSSI.

Brasenose Wood has a well defined coppice-with-standards structure and is one of the few English woods which are still actively managed by this traditional method. The greater part of the wood is an ancient remnant of Shotover Forest with a documented history dating back to the thirteenth century. The flora in the wood is exceptionally rich for a wood of this size with 221 recorded vascular plant species including 46 which are characteristic of ancient woodland.

The SSSI forms part of the larger Shotover Country Park, which offers views across Oxford and is a popular recreational site for residents and visitors alike. The area is also designated as Shotover CTA.

Bernwood Forest (in the vicinity in the Stanton St John, Horton-cum-Studley, Boarstall and Oakley area)

The area East of Oxford is characterised by a mosaic of woodlands, meadows and agricultural fields, which form part of the former Royal Hunting Forest of Bernwood. It includes a complex of numerous ancient woodlands including Shabbington Wood (SSSI - Forestry Commission) and Whitecross Green Wood (SSSI / BBOWT nature reserve). It also includes lowland meadow priority habitat including Bernwood Meadows (SSSI / BBOWT nature reserve) and Asham Meads (SSSI / BBOWT nature reserve). These are MG4/MG5 meadows and thus the issue regarding SSSI designation dealt with in the section of the Ray Valley, and in Appendix 1 below, also applies to MG5 meadows.

The area is designated as the Bernwood CTA/BOA, which crosses the Oxfordshire-Buckinghamshire border.

Bernwood Forest in the Brill area

This is another part of the ancient Royal Hunting Forest of Bernwood and within Bernwood BOA. It includes a complex of numerous ancient woodlands including Rushbeds Wood (SSSI – BBOWT nature reserve) and Chinkwell Wood (LWS). It also includes areas of lowland meadows and calcareous grassland priority habitats including Brill Common LWS.

Otmoor Basin (in the vicinity of Horton-cum-Studley, Murcott and Charlton-on-Otmoor)

This area is host to a large wetland RSPB nature reserve, Otmoor, which is home to a rich ensemble of priority habitats (floodplain grazing marsh, reedbed, ponds, hedgerows, scrub) which supports valuable breeding populations of breeding waders that are declining considerably including lapwing, curlew and snipe. Otmoor is also home to numerous other red-listed birds of conservation concern and a well-known and dazzlingly impressive starling murmuration, bringing visitors to the area. The Otmoor Basin is host to an SSSI and Local Wildlife Sites and is a CTA. Like Bernwood described below it has exceptionally high quality hedgerows which are host to numerous species.

As a result of the rich wildlife described in the above two sections, BBOWT and RSPB have been working together for many years on a combined Living Landscape/Futurescape for the Otmoor/Ray area, encouraging landscape scale conservation to safeguard existing habitat and create new habitat. See http://www.bbowt.org.uk/what-we-do/living-landscapes/upper-river-ray-floodplain and https://www.rspb.org.uk/our-work/conservation/landscape-scale-conservation/sites/upper-thames-river-valleys/ for more details.

Upper Ray Valley (in the vicinity of Ambrosden, Blackthorn, Grendon Underwood and Ludgershall)

Host to numerous BBOWT nature reserves, the Upper Ray Valley has large areas of floodplain meadow habitat (known technically as MG4 habitat) of which there is only 1500ha remaining in the UK[4]. A type of traditional hay meadow that forms in river floodplains, it is one of our rarest habitats and every summer plays host to a dazzling array of flowers, some of them unique to the habitat, and associated insects and other animals. Across the UK it is estimated that we have lost 97% of our wildlife-rich meadows[5]. The Ray Valley is one of the last remaining strongholds of floodplain meadow habitat. The BBOWT reserves within the Ray Valley alone host a significant proportion of the remaining MG4 floodplain meadow habitat in the UK and there are substantial areas in the Ray Valley outside of the BBOWT reserves. There are numerous designated sites including SSSIs and LWSs. The Ray Valley sites are of similar quality to the nearby Oxford Meadows floodplain meadow habitat which have received European designation as an SAC.

In 2014 Natural England published a revision to Chapter 3 (Lowland Grasslands) of the Guidelines for the Selection of Biological SSSIs. Essentially, this document recognised that certain types of lowland grassland priority habitat (including the MG4 priority habitat referred to above) were now so rare and threatened that the standard SSSI protocols of selecting a sample of sites that meet SSSI standards were no longer appropriate and that "*all examples greater than 0.5 ha should be selected.*" BBOWT is currently working with Natural England with respect to taking forward an assessment of the value of the MG4/5 habitat in the Ray Valley and Bernwood areas with a view to potentially bringing forward a SSSI designation to cover a number of them. We consider that until Natural England provide advice on how such sites should be treated, the planning system should treat impacts on blocks of MG4/MG5 habitat greater than 0.5 ha in area on the basis that the site qualifies as a SSSI. Further details of the Revision to Chapter 3 are in Appendix 2.

The Centre for Ecology and Hydrology (CEH) have copies of a number of historic surveys of the grasslands in the area. We have seen them but are not at liberty to pass them on and if you wish to see them then we recommend approaching CEH direct for copies of these.

The Upper Ray is a BOA, and host to breeding waders such as curlew and lapwing which are declining rapidly in the UK and are red-listed Birds of Conservation Concern. The curlew in particular is exceptionally intolerant of human disturbance and requires isolated undisturbed

[4] http://www.floodplainmeadows.org.uk/floodplain-meadow-technical-handbook

[5] https://www.theguardian.com/commentisfree/2015/may/18/losing-97-percent-britain-wildflower-meadows-matters-butterfly

farmland in the area to breed. Like Bernwood described below, the Ray Valley has exceptionally high quality hedgerows which are host to numerous species.

Bernwood Forest (in the vicinity of Calvert, Charndon, Grendon Underwood, Quainton and Middle Claydon)

The Ancient Hunting Forest of Bernwood (see https://en.wikipedia.org/wiki/Bernwood_Forest) lies right in the heart of the Route B Expressway route zone. It is one of the most undisturbed and wildlife-rich areas of Buckinghamshire. It includes numerous areas of ancient woodland, an irreplaceable habitat, many of them designated as SSSIs, as well as species-rich grassland, open water, scrub and hedgerows. In recognition of the value of these woodlands BBOWT have recently been working on a Bernwood Forest project to enhance the wildlife value of some of these ancient woodlands.

The ancient woodlands in the vicinity of Calvert (including Sheephouse Wood, Finemere Wood, Grendon and Doddershall Wood and others) play host to an exceptionally varied and species-rich complex of bat populations (bats are European protected species). One bat species, the Bechstein's Bat is exceptionally rare in the UK, with an estimated population of only 1500 adults[6], and Bernwood plays host to one of the most northerly populations of the species in the UK. The Statement of Case submitted by BBOWT in relation to the FCC sidings on the HS2 route sets out a case in section 3 that the area should be designated at European level as an SAC (Special Area of Conservation) because of the exceptional value of the population of the rare Bechstein's Bat. This is attached in Appendix 3.

Bernwood is a BOA and is also host to numerous MG5 lowland meadows. The issue regarding SSSI designation dealt with in the section of the Ray Valley above, and in Appendix 1 below, also applies to MG5 meadows.

Along with the Ray Valley and Otmoor, Bernwood is host to some of the most biologically valuable ancient hedgerows in the UK. The hedgerows characteristic to the area include a very high % content of blackthorn (amply demonstrated by a drive along the quiet rural roads of Bernwood in early Spring to witness the stunning display of blackthorn flowers). As a result the Bernwood, Otmoor, Ray areas have become the UK stronghold for brown and black hairstreak butterflies which both require blackthorn to complete their life cycle. Both butterflies spread only slowly and are very vulnerable to loss of hedgerows containing their breeding colonies. Further details on these butterflies are attached in the form of a Butterfly Conservation document. In recognition of the value of the hedgerows in the area, BBOWT are working in partnership with Aylesbury Vale District Council on a Hedgerow Havens project aiming to restore hedgerows and other key features of the landscape in the Bernwood/Ray areas.

This zone also includes a complex of high biodiversity sites to the N of Calvert including BBOWT Calvert Jubilee nature reserve, and Grebe Lake, both Local Wildlife Sites, and the neighbouring Calvert Brick Pits nature reserve.

[6] http://www.bats.org.uk/pages/bechsteins_bat_facts.html

Whaddon Chase, North Bucks Fens, Claydon and Padbury Streams and Tingewick Meadows and Woods

These BOAs are just to the west of Bletchley and contain wildlife rich ancient woodlands, fens, lowland meadows and streams. The BBOWT nature reserve Pilch Fields, lies in the North Bucks Fens BOA, fairly close to the A421.

Ouzel Valley

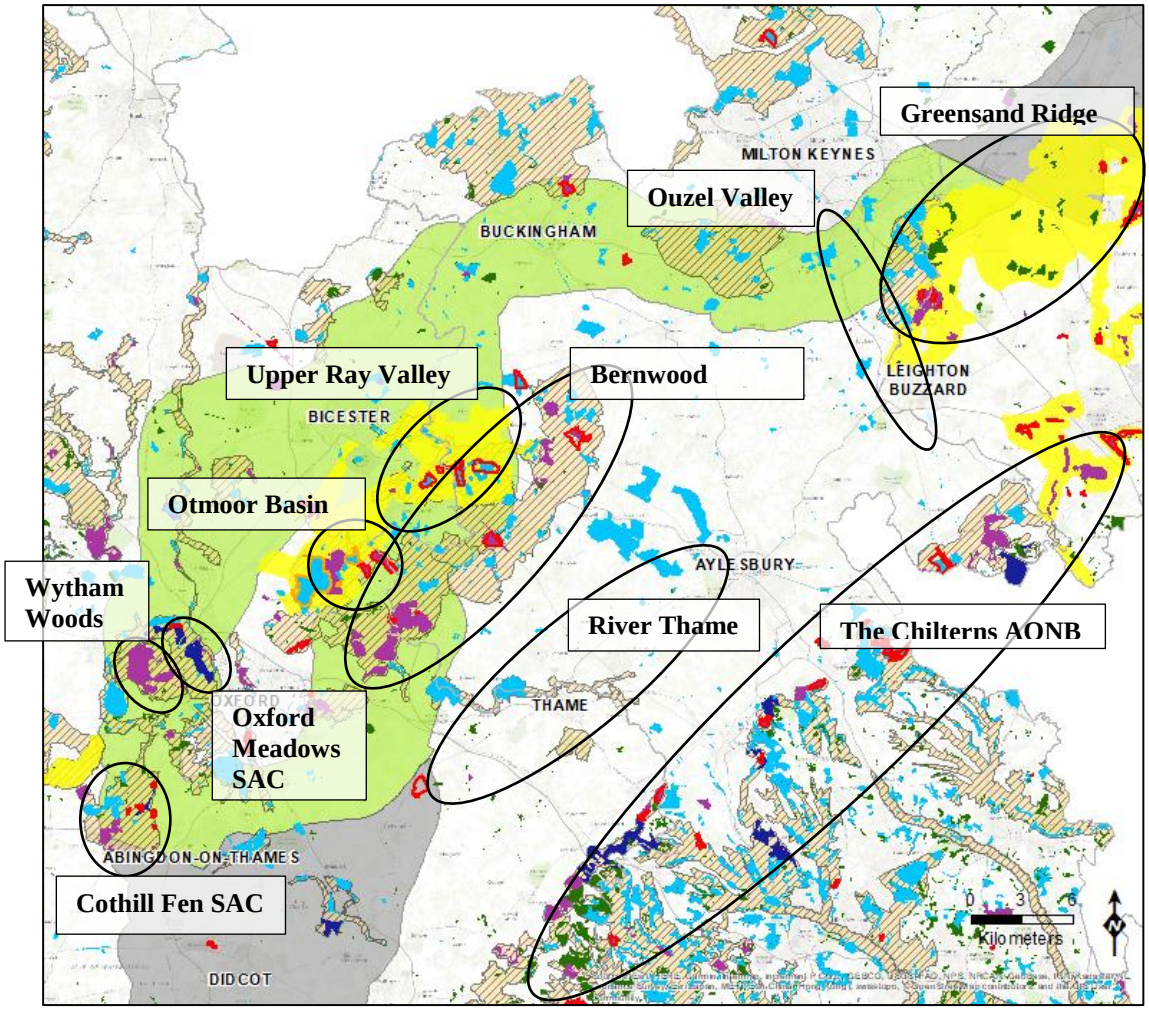
All three of the corridors cross the River Ouzel BOA to the SE of Milton Keynes. The river and its associated habitats either side must be taken into account in the exact route choice following corridor selection.

Greensand Ridge

The Greensand Ridge has been designated as a Nature Improvement Area (NIA) in recognition of the existing network of wildlife rich sites, particularly heathlands, grasslands and woodlands. Corridor C includes part of one of the hotspots for biodiversity within the NIA which is around Woburn. Here the route corridor includes the woodlands to the west of Woburn, which contain Wavendon Heath Ponds SSSI. It also includes an area which is known locally as the Aspley Guise triangle (the section of land between the M1 and railway line north of the village of Aspley Guise). Within this triangle there are fragments of wildflower rich lowland meadow. Any route within this corridor would need to avoid these biodiversity features and maintain linkages to them from along the Ridge.

Conclusion

The Wildlife Trusts have serious concerns over Corridor C. In Oxfordshire Corridor C is the same as Corridor B and raises the same significant concerns. In Buckinghamshire Corridor C raises fewer concerns than Corridor B but nevertheless, if Corridor C is chosen then there are some critically important wildlife sites within the corridor on which impact would need to be avoided.



Map 8: Selected key natural environment constraints along Corridor C.

6. Conclusions

The Wildlife Trusts have a number of very serious concerns with regard to the environmental impacts of the Expressway and associated development.

It is The Wildlife Trusts' view that strategic development proposals, such as the development of the Expressway, should be brought forward within a framework which has been subject to the process of Strategic Environmental Assessment (SEA). We are also concerned by the lack of commitment by Highways England to achieving a real net gain in biodiversity despite this being promoted by national planning policy guidance and being adopted in many other strategic projects.

The Wildlife Trusts have concerns about all the corridors and are not expressing a preference for a corridor and have set out our concerns that all corridor options would give rise to significant nature conservation impacts. Map 9 below highlights key ecological areas of constraints between Oxford and Cambridge. However, whilst we have concerns about all three corridor options the corridor we have by far the most concerns about Corridor B and Corridor

C around Oxford, and believe that the impacts on biodiversity of Corridor B are so serious that the route should be discounted

The following tables show the number of designated sites affected by the different route corridors. Please note that the data does not include LWS data from Bedfordshire and Cambridgeshire. Tables 1 & 2 also shows the impact on priority habitats by each corridor. All tables show that Corridor B would have the greatest adverse effect on designated sites and priority habitats, followed by Corridor C. Corridor A would have least direct impacts on designated sites or habitats, however, this does not mean that this corridor would not give rise to significant ecological effects including indirect effects on the habitats and species of the Chilterns.

Table 1: Number of designated sites fully or partially within the route corridors.

Count of Sites/Areas	Corridor Option			
Designation	A	B	C	Common Section
SSSI	17	51	45	11
SAC	1	3	3	1
BBOWT Nature Reserve	2	17	16	3
WTBCN Nature Reserve	3	2		4
RSPB Nature Reserve		1	1	
Ancient Woodland	151	418	391	130
BNS	63	111	80	
LWS	50	234	194	69
BOA (S.E.)	10	49	45	5
BCN Ecological Networks				2
Grand Total	**297**	**886**	**775**	**225**

Notes: 1) column grand totals: please note that the designations are not all mutually exclusive. SACs will also be SSSIs, could also be AW, nature reserves etc.
2) the data does not include LWS data for Bedfordshire and Cambridgeshire.

Table 2: Area (ha) of designated sites fully or partially within the route corridors

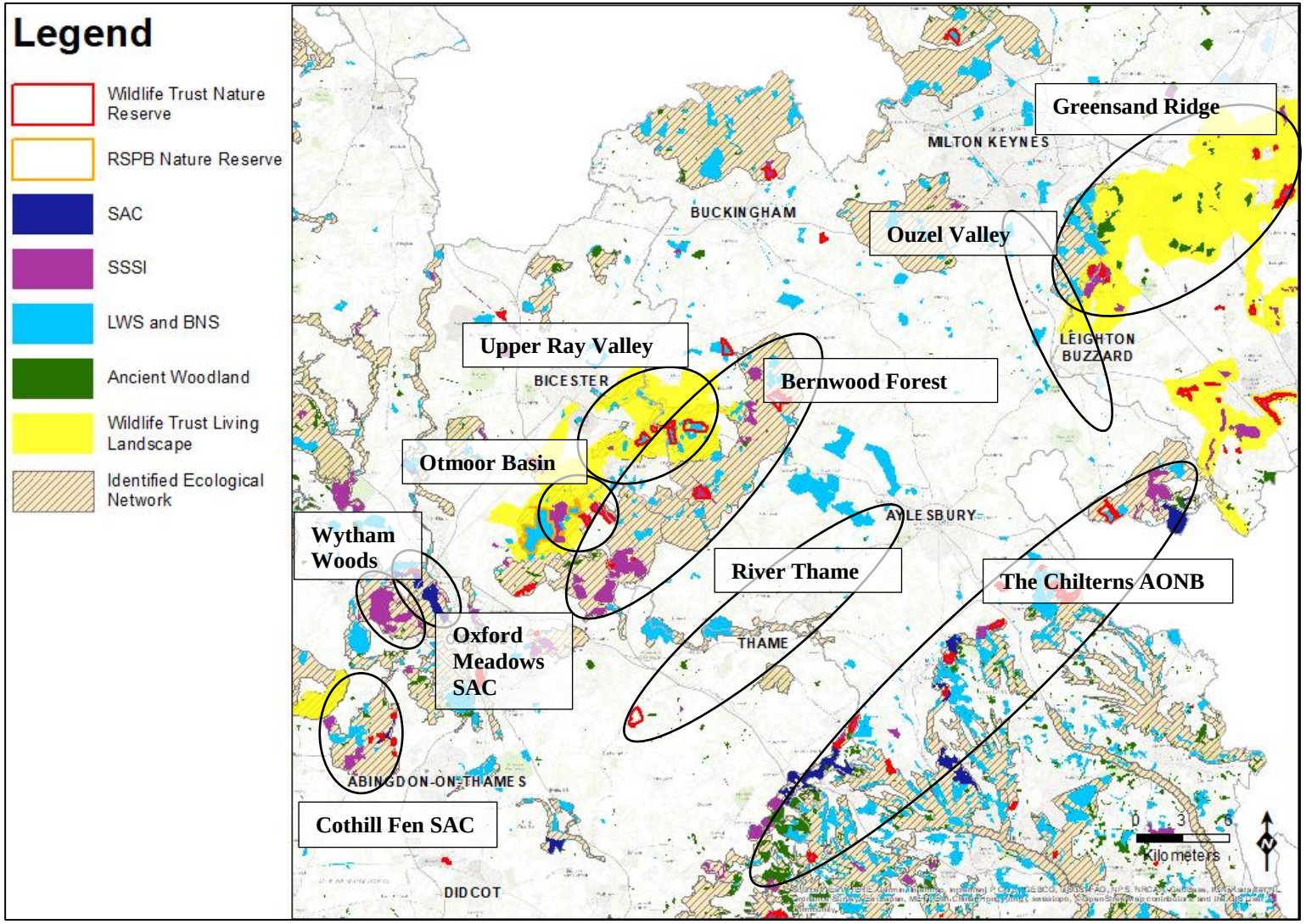
Sum of Area (Ha)	Corridor Option			
Designation	A	B	C	Common Section
SSSI	265	2353	2032	263
SAC	0	311	311	69
BBOWT Nature Reserve	10	485	391	114
WTBCN Nature Reserve	22	18		56
RSPB Nature Reserve		52	52	
Ancient Woodland	909	2730	2335	561
BNS	1626	1702	820	
LWS	437	2600	2214	575
BOA (S.E.)	3047	21032	17531	2591
BCN Ecological Networks				2817
Grand Total	**6317**	**31284**	**25685**	**7046**

Notes: 1) column grand totals: please note that the designations are not all mutually exclusive. SACs will also be SSSIs, could also be AW, nature reserves etc.
2) the data does not include LWS data for Bedfordshire and Cambridgeshire.

Table 3: Area of Priority Habitat in Oxfordshire and Buckinghamshire affected by the route corridors

PHI Area (Ha)	Corridor Options			
PHI Type	**A**	**B**	**C**	**Common Section**
Coastal and floodplain grazing marsh	393	1055	1037	414
Deciduous woodland	1955	4439	3792	2211
Good quality semi-improved grassland	517	772	665	113
Lowland calcareous grassland	1	44	42	143
Lowland dry acid grassland	137	170	159	63
Lowland fens	15	77	80	41
Lowland heathland	34	33	9	19
Lowland meadows	96	988	877	134
Purple moor grass and rush pastures	18	24	17	
Reedbeds		3	3	1
Traditional orchard	24	43	30	67
No main habitat but additional habitats present	358	825	687	527
Grand Total	**3547**	**8474**	**7399**	**3733**

Note: Source of data – Natural England Priority Habitat dataset.



Map 9: Selected key natural environment constraints between Oxford and Milton Keynes.

7. Appendices

Appendix 1: Net Gain for biodiversity from developments

Introduction

This note has been produced in January 2017 by the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust to set out the national policy background for planned development, that is development brought forward through the spatial planning process, to contribute to the provision of net gains for biodiversity.

The note sets out the relevant sections of the government's policy on planning, as embodied in the National Planning Policy Framework (NPPF), and in the guidance that supports the interpretation of the NPPF. It then details the relevant sections of the Natural Environment White Paper, which, pending the production of the 25 year plan for the Natural Environment due to be drafted this year (2017), remains the Government's current policy statement on biodiversity issues.

We then highlight relevant parts of the recent review of HS2 Ltd's approach to biodiversity impacts carried out by Natural England at the request of the High Speed Rail (London - West Midlands) Bill Select Committee (Commons).

Examples are provided of bodies engaged with the planning process who have developed approaches designed to provide a net gain in biodiversity. Finally we add our interpretation of implications of the information.

Throughout this note we have ensured that quotations are accurate at the current time. However, planning policy changes rapidly, and care should be taken to check that the information remains current. Where possible we have provided links to the relevant information to make checking as simple as possible. Where context is required we have used bold type to emphasise the sections of text directly related to net gain for biodiversity.

National policy and guidance

This section of this note contains quotes from the National Planning Policy Framework (NPPF), the Government's guidance that supports the interpretation of the NPPF, provided only on the .gov.uk website, The National Planning Policy Framework

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

NPPF paragraph 7 states:

> "*7. There are three dimensions to sustainable development: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:……*

● *an environmental role – contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural*

resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy."

NPPF paragraph 8 states:

"*to achieve sustainable development, economic, social and environmental gains should be sought jointly and simultaneously through the planning system…"*

NPPF paragraph 9 states:

Pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, as well as in people's quality of life, including (but not limited to):……

● *moving from a net loss of bio-diversity to achieving net gains for nature*;

NPPF paragraph 17 states:

"Within the overarching roles that the planning system ought to play, a set of core land-use planning principles should underpin both plan-making and decision-taking. These 12 principles are that planning should:…….

…….contribute to conserving and enhancing the natural environment"

NPPF paragraph 109 states:

"*The planning system should contribute to and enhance the natural and local environment by:*

minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;"

NPPF paragraph 114 states:

"114. Local planning authorities should:

● *set out a strategic approach in their Local Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure…."*

NPPF paragraph 118 states:

"*118. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:*

● *if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;…….*

● *opportunities to incorporate biodiversity in and around developments should be encouraged;"*

NPPF paragraph 152 states:

"Local planning authorities should seek opportunities to achieve each of the economic, social and environmental dimensions of sustainable development, and net gains across all three."

NPPF paragraph 157 states:

"Crucially, Local Plans should:

[…]

● *contain a clear strategy for enhancing the natural, built and historic environment, and supporting Nature Improvement Areas where they have been identified."*

NPPF paragraph 187 states:

".....Local planning authorities should work proactively with applicants to secure developments that improve the economic, social and environmental conditions of the area."

NPPF planning guidance (provided only on .gov.uk)

http://planningguidance.planningportal.gov.uk/blog/guidance/natural-environment/biodiversity-ecosystems-and-green-infrastructure/

"*Is there a statutory basis for planning to seek to minimise impacts on biodiversity and provide net gains in biodiversity where possible?*

Yes. Section 40 of the Natural Environment and Rural Communities Act 2006, which places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. A key purpose of this duty is to embed consideration of biodiversity as an integral part of policy and decision making throughout the public sector, which should be seeking to make a significant contribution to the achievement of the commitments made by Government in its Biodiversity 2020 strategy……..

The National Planning Policy Framework is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution.

See related policy: paragraph 9 ; paragraph 17 – 7th bullet; paragraph 109; paragraph 113; paragraph 114; paragraph 117; paragraph 118; paragraph 119; paragraph 157 – last bullet"

The Natural Environment White Paper

Issued in 2011 by the Coalition Government, the Natural Environment White Paper remains the Government's formal policy, although a green paper setting the framework for a 25 year plan for the natural environment is expected imminently.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228842/8082.pdf

The Executive Summary states:

"5. Past action has often taken place on too small a scale. We want to promote an ambitious, integrated approach, creating a resilient ecological network across England. We will move from net biodiversity loss to net gain, by supporting healthy, well-functioning ecosystems and coherent ecological networks……

"6…… Through reforms of the planning system, we will take a strategic approach to planning for nature within and across local areas. This approach will guide development to the best locations, encourage greener design and enable development to enhance natural networks. We will retain the protection and improvement of the natural environment as core objectives of the planning system. We will establish a new, voluntary approach to biodiversity offsets and test our approach in pilot areas."

The white paper states:

"2.33… The Government expects the planning system to deliver the homes, business, infrastructure and thriving local places that the country needs, while protecting and enhancing the natural and historic environment.

2.35…We need a more strategic and integrated approach to planning for nature within and across local areas, one that guides development to the best locations, encourages greener design and enables development to enhance natural networks for the benefit of people and the environment as part of sustainable development. We will retain protection and improvement of the natural environment as core objectives for local planning and development management.

2.8….We will move progressively from net biodiversity loss to net gain, by supporting healthy, well-functioning ecosystems and establishing more coherent ecological networks."

Natural England's review of HS2 Ltd's No Net Loss Metric

In preparing the Bill to bring forward the first phase of the High Speed Two rail proposals, HS2 Ltd, the government owned company established to deliver the project, set themselves a target of No Net Loss to biodiversity from the scheme. An independent review of HS2 Ltd's approach was requested by the High Speed Rail (London - West Midlands) Bill Select Committee (Commons), which was carried out by Natural England.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/565691/review-of-hs2-no-net-loss-metric.pdf

"10.34 ….. Looking ahead to HS2 Phase 2, and having regard for the emerging commitments to achieving a net gain for biodiversity by other infrastructure providers such as Network Rail and

Highways England, there is clearly an impetus to make a greater contribution to biodiversity conservation for HS2 Phase 2. The terms 'net positive' or 'net gain' are now commonly used to signal a commitment to achieving a biodiversity credit rather than simply preventing a deficit.

10.35 The NPPF requires development to achieve a net gain where possible. It is also a principle promoted by the aforementioned international biodiversity offsetting standard (BBOP, 2012). Natural England advises that in applying this national policy and conforming to international standards, it should be assumed that achieving a net gain is possible, unless there are clear justifications as to why it is not possible. If biodiversity declines are to be reversed, a net gain approach needs to be embedded as standard practice. Phase 2 is an opportunity for innovative and exiting biodiversity projects to be realised under a net gain approach, with the benefit of a considerable timeframe in which to develop stakeholder relations, commission research and gather evidence.

Recommendation

10.36 It is recommended that for Phase 2 the metric should be applied for the purpose of meeting a net gain objective in order to fully accord with national policy, rather than simply aiming to achieve NNL."

Industry approaches to net gain in biodiversity:
CIRIA CIEEM IEMA Biodiversity Net Gain – Principles and Guidance for UK Construction and Developmentshttp://www.cieem.net/biodiversity-net-gain-principles-and-guidance-for-uk-construction-and-developments

Principle 5: "**Make a measurable Net Gain contribution - Achieve a measurable, overall gain for biodiversity** and the services ecosystems provide while directly contributing towards nature conservation priorities."

The Berkeley Group
Berkeley Group have committed to achieving a net gain in biodiversity on their developments - see https://www.berkeleygroup.co.uk/sustainability/environmental-sustainability

Network Rail
For the proposed East-West Rail line, Network Rail are committed to providing a net gain in biodiversity. The EIA Scoping Report states in paragraph 9.6.2: "A biodiversity unit calculation to measure losses and gains in biodiversity will be applied to the Scheme…..In line with Network Rail objectives the Scheme is aiming for a measurable net biodiversity gain"

https://consultations.networkrail.co.uk/communications/ewr-phase-2/supporting_documents/Scheme%20Scoping%20Report%20Final%20inc.%20Appendices.%20Version%201.3.pdf

BBOWT's conclusions

The NPPF sets out clearly that Local Plans must result in a net gain in biodiversity (e.g. paragraphs 7, 8, 9, 17, 109, 152 and NPPF guidance). In so doing the NPPF is putting in place the means to secure a contribution to the aims of the Natural Environment White Paper which states "*We will move from net biodiversity loss to net gain"* and specifically references the planning system.

In effect, Local Plans can only achieve a net gain in biodiversity if the vast majority of applications approved under the Local Plan achieve a net gain in biodiversity and so it is reasonable therefore to make a net gain in biodiversity an expectation of each application either directly themselves, or through a mechanism for pooled contributions where one exists.

In their Review of the HS2 No Net Loss metric Natural England advises that *"in applying this national policy and conforming to international standards, it should be assumed that achieving a net gain is possible, unless there are clear justifications as to why it is not possible."*

Paragraph 118 of the NPPF sets out that where significant harm to biodiversity cannot be avoided (and makes clear that alternatives should be sought as a first principle), mitigation or compensation should be put in place which serves the aim of enhancing biodiversity. It follows therefore that, where applications cannot achieve a net gain on-site, off-site compensation which provides a net gain to biodiversity must be delivered.

Appendix 2

Further details on the Natural England decision to change the SSSI selection criteria for some species-rich grasslands:

Chapter 3 is available at http://jncc.defra.gov.uk/pdf/SSSI_Chptr03_revision_2014(v1.0).pdf

Paragraph 2.1 states: *"Large areas of ancient semi-natural lowland grassland have been lost during this period, though it is rarely possible to provide accurate figures. For example, it has been estimated that 97% of lowland unimproved grassland was lost between 1930 and 1984 in England and Wales (Fuller 1987)."*

4.3 states: *"The approach adopted below places much more of an emphasis on a minimum or critical standards approach. This is in response to the increased knowledge of the status of British semi-natural grasslands gained over the 25 years since the guidelines were published and the urgency of conserving the remaining resource by a suite of measures, of which SSSI designation is pre-eminent."*

4.10 states: *"The national extent of any grassland type should be taken into account during the selection of sites for notification from those that qualify for selection. For those grassland communities that are now rare (less than 10,000ha in Great Britain or less than 10,000ha in the British lowlands, as shown in section A of Annex 1) the presumption is that all examples which are at least 0.5ha should be selected for notification, singly or in combination."*

MG4/5 grassland, the priority habitats relevant to the area, are listed in Annex 1 as grassland communities of high botanical nature conservation value, with less than 10,000 ha in Great Britain.

The NPPF is clear on how SSSIs should be treated in the planning system:

"118. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:……

proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;"

Appendix 3

Extract from Statement of Case for the BERKSHIRE, BUCKINGHAMSHIRE AND OXFORDSHIRE WILDLIFE TRUST In respect of Transport and Works Act 1992 (TWA) Application for the High Speed Rail (London – West Midlands) (Greatmoor Sidings etc.) Order.

The impact on bats, in particular Bechstein's bats (*Myotis bechsteinii*)

The status of Bechstein's bats

Battersby (2005) (see Appendix 4) describes the Bechstein's bat as being "*very rare*" in Great Britain, and goes on to state that the species is "*probably one of the UK's rarest resident mammals, its rarity may make it vulnerable to the loss of individual roost sites and foraging areas*." The global range of Bechstein's bat is almost restricted to Europe, extending from southern Sweden the Straits of Gibraltar, and from the Atlantic coast of Portugal to the Black Sea. Small patches of the range occur in Asia Minor and Caucasia[7]. The species is assessed as 'near-threatened' globally (IUCN 2016 assessment (ver 3.1)) [8]; and 'vulnerable' in Continental Europe and the EU25 (Temple & Terry 2007, Appendix 1 p. 31)[9]. Vulnerable is defined by the IUCN[10] as:

"*VULNERABLE (VU)*

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild."

Bechstein's bat is listed in Annexes II and IV of European Council Directive on the conservation of natural habitats and of wild fauna and flora (92/43/EEC) ("the Habitats Directive"). Annex II species are subject to provisions for the designation of Special Areas of Conservation (SACs) with the objective of contributing significantly to maintaining or achieving a favourable conservation status; Annex IV species are subject to provisions of strict protection.

Bechstein's bat is a Species of Principal Importance in England, listed in accordance with section 41 of the Natural Environment and Rural Communities Act 2006. The species is listed in Annex II of The Convention on the Conservation of European Wildlife and Natural Habitats ("the Bern Convention") which identifies species in need of "*Special protection*", and in Annex

[7] http://maps.iucnredlist.org/map.html?id=14123
[8] http://www.iucnredlist.org/details/14123/0 Accessed 10th December 2016
[9] Temple, H.J. & Terry, A. (2007) The Status and Distribution of European Mammals. Office for Official Publications of the European Communities, Luxembourg. http://ec.europa.eu/environment/nature/conservation/species/redlist/downloads/European_mammals.pdf
[10] IUCN. (2012). IUCN Red List Categories and Criteria: Version 3.1. Second edition. Gland, Switzerland and Cambridge, UK: IUCN.

I of The Agreement on the Conservation of Populations of European Bats, itself established under the Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention). Bechstein's bats, together with all native species of bat, are protected under the Wildlife and Countryside Act, 1981.

The Bat Conservation Trust's Bechstein's Bat Survey Final report September 2007 – September 2011 (BCT, undated) says:

"*In the UK Bechstein's bat is restricted to parts of southern England and south Wales, which comprise the northwestern edge of its European range. In Europe this species is found from England to Caucasus, and south to the Mediterranean (Harris et al., 2008).*

Bechstein's bat is predominantly associated with ancient broadleaf woodlands (Greenaway & Hill, 2004); and previous studies have shown a strong association with oak and ash woodland (Hill & Greenaway, 2006). In the UK this species is thought to use woodlands all year round, favouring old woodpecker holes for both summer and winter roosting, although winter records for this species are rare. During the summer female Bechstein's bats form maternity colonies. These colonies use multiple roosts throughout the season, frequently splitting into subgroups (Kerth & Koenig, 1999) and switching roost sites regularly. Bechstein's bat is a gleaning bat with a preference for moths, with most foraging occurring in closed canopy (Harris & Yalden, 2008). Studies have shown that foraging occurs close to the roosting site, with bats rarely flying more than 1.5km between roost and feeding site (Schofield & Morris, 2000)."

The importance of the Bernwood Forest for Bechstein's Bats

The importance of the Bernwood Forest for bats has long been known. The Derogation Report, in paragraph 1.1.6, lists 13 species known to be present in the Calvert area of the Forest, and details the known importance of the populations of the various species:

"Field studies undertaken by local bat experts in recent years have confirmed that the woodland complex in the vicinity of Calvert (part of Bernwood Forest) is of high value for bats, especially for the rare Bechstein's bat. HS2 Ltd has therefore undertaken detailed bat studies including radio-tracking work since 2012 to enable environmental assessment and development of appropriate mitigation measures. These studies confirmed the presence of a nationally important population of Bechstein's bat, as well as a regionally important assemblage of woodland bats (Brandt's, Natterer's, brown long-eared, Daubenton's and whiskered bats). Other bats present in the area are barbastelle, serotine, noctule, Leisler's, common pipistrelle, soprano pipistrelle and Nathusius' pipistrelle."

The presence of Bechstein's bat in the area was confirmed in 2010 as a result of survey work undertaken by the North Buckinghamshire Bat Group's (NBBG) Bernwood Forest Bechstein's Project (BFBP), under the auspices of the Bat Conservation Trust. In May 2011 the BFBP confirmed the presence of two adult female Bechstein's bats in breeding condition in Finemere Woods Nature Reserve. We wrote to HS2 Ltd. immediately to alert them to the likely presence

of a breeding population, and to highlight the concerns that were likely to arise from the discovery. Our letter is attached in Append 5.

Survey work undertaken by both the BFBP and HS2 Ltd, summarised in the Derogation Report, has confirmed that the population of Bechstein's bats in the Bernwood Forest is nationally important.

The UK's contribution to the Natura 2000 network of sites includes six SACs in which Bechstein's bat is a primary reason for the selection of the site, a further three sites where the species is a 'qualifying feature' but not a primary reason for selection, and four more SACs where the species is cited as present but at a 'non-significant' level.

The significance of the Bernwood Forest Bechstein's bat population at national and European levels was not known when the process of establishing SACs under Annex III of the Habitats Directive was initiated in the mid-1990s. The UK distribution map for the species in 2000 indicates that Bechstein's bats were not recorded from the area. While information on the status and distribution of Bechstein's bats has improved significantly over the last two decades, it is clear that the species is at an unfavourable conservation status, both in the UK and elsewhere in Europe. The latest EU assessment for the 2007-2012 reporting period records Bechstein's bat as 'unfavourable' in all biogeographical regions in which it occurs; in the Mediterranean region it is classified as 'unfavourable-bad'; in all other regions, including the Atlantic biogeographical region it is 'unfavourable-inadequate'.

Comparing information on the UK SACs in which Bechstein's bat is a qualifying feature for designation, set out in Table 1 below, it is clear that the Bernwood Forest population would qualify the area to be recognised as a Site of Community Importance (SCI) as defined in Article 1(k) of the Habitats Directive. This indicates that the Bernwood colonies of Bechstein's bats should be afforded protection from any damage or disturbance to both the individuals and their habitat that would be detrimental to their conservation status.

The comparative assessment values in Table 1for Bernwood Forest are based on an estimated population in the region of 300-500 individuals (and an assumed national population of 5,000 – 10,000 individuals), the current degree of conservation of supporting features (including restoration potential, but excluding the impacts of the HS2 Phase 1 proposals), and the highly isolated nature of the population, taking into account the emerging evidence mentioned in paragraph 3.12 below.

Table 1.

Bechstein's bats in UK SACs and comparative assessment of Bernwood Forest

SITE	ASSESSMENT CRITERIA			
	Population	Conservation	Isolation	Global
UK0012584 Bath & Bradford-on-Avon	C	C	C	**A**
UK0012585 Beer Quarry & Caves	B	A	C	**B**
UK0030095 Bracket's Coppice	A	B	A	**B**
UK0016373 Briddlesford Copses	C	B	C	**B**
UK0016373 Chilmark Quarries	C	B	C	**B**
UK0012715 Ebernoe Common	A	B	A	**A**
UK0030148 Exmoor & Quantock Oakwoods	C	B	C	**C**
UK0012804 Mole Gap to Reigate Escarpment	C	B	C	**C**
UK0030337 Singleton & Cocking Tunnels	C	B	B	**C**
Bernwood Forest	B	B	A	**B**

Sources: All except the Bernwood Forest data extracted from JNCC Natura 2000 Standard Data Form as submitted to the European Commission in December 2015. Bernwood Forest assessment compiled by I. Hepburn with advice and information from C. Damant, M. Jackson, P. Wright and J. Altringham (December 2016)

The BFBP has worked with Patrick Wright, who is currently undertaking a PhD studentship at Exeter University together with The Vincent Wildlife Trust on the subject of "*Molecular approaches to improve the conservation of Bechstein's bats*." Mr Wright provided a statement to the BFBP at the end of November 2016 which gives an indication of the interim findings of his work. The statement, included at Appendix 6, says:

"The bat population from Bernwood appears to be the most isolated of all UK populations and is showing lower levels of genetic diversity. More research is needed to identify the precise threats to the species, but it is reasonable to assume that any additional developments near the Bernwood population could increase their isolation still further, resulting in inbreeding and negative consequences for the viability of this population."