

## High Speed 2, Phase One Environmental Statement Consultation

### Response by the RSPB - February 2014

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#### The main points of our response:

Our response focuses on two significant issues: the first in relation to HS2 as a low-carbon transport option, the second on how impacts on biodiversity have been assessed and dealt with.

**1) HS2 is not yet delivering on its potential to be a low carbon transport option.** We believe that HS2 Ltd and the Government could and should go much further in putting forward a package of practical and policy measures that would allow high speed rail to fulfil its role as part of a low carbon transport system of the future.

**2) The Environmental Statement (ES) seriously misrepresents the impact of HS2 on biodiversity.** We identify four major flaws:

- i. **Extending the definition of mitigation to include compensation is the wrong approach, and conflicts with the National Planning Policy Framework (NPPF).** It enables, for example, the ES to conclude there are no significant adverse residual effects on at least two nationally important Sites of Special Scientific Interest (SSSIs). The error is compounded by flaws in the design and application of a modified version of the Defra biodiversity offsetting pilot methodology.
- ii. **Claims made for the effectiveness of some biodiversity mitigation and compensatory measures are over-optimistic, and unsupported (or even contradicted) by some available scientific evidence.** This serious weakness is used, for example, to gloss over clear adverse effects to at least two SSSIs and significant risks to the future conservation status of Bechstein's bats.
- iii. **Detailed information on habitat losses and gains still has not been provided, and what is provided is not in a transparent and easily understandable format.** It is not acceptable that we have to wait for HS2 Ltd to produce yet more documentation after Hybrid Bill submission, to demonstrate whether or not the principle of no net loss will really be adhered to.
- iv. **HS2 should set a new high standard for environmental protection and enhancement which leads to a net gain in biodiversity.** Simply aiming for no net loss of biodiversity is not good enough for a high profile national infrastructure project, and not consistent with the NPPF.

In light of the above points (and the detailed comments which follow), the RSPB cannot support HS2 without clear evidence that its impact on the natural environment will be properly mitigated, and unavoidable impacts fully compensated for, and real reductions in carbon emissions secured. While in principle we support High Speed Rail as a low-carbon alternative to road-building or airport expansion, we have yet to see a case for how HS2 will meet these essential requirements.

## 1. Detailed Response to HS2 Phase 1 Environmental Statement (ES)

### 1.1 Comments on Volume 1: Non-technical Summary (NTS)

#### 1.2 Section 1.2, including Figure 3

1.3 Volume 1, section 1.2 of the NTS wrongly extends the definition of mitigation to include compensation. This basic error extends throughout the rest of the ES, including the Community Forum Area (CFA) reports that appraise the impacts on protected sites. In such cases, habitats to be created to compensate for unavoidable damage to protected sites are wrongly identified as mitigation and on that basis, the ES suggests there are no residual adverse effects on protected sites, including nationally important SSSIs. This approach is wrong and conflicts with Government planning policy set out in the National Planning Policy Framework (NPPF). It results in a **serious misrepresentation** of the effects of HS2 on biodiversity. It is also in direct conflict with the stated approach in paragraph 1.3.4 of the Ecology Technical Note – Methodology for demonstrating no net loss in biodiversity (part of ES Volume 5, scope and methodology report addendum CT-001-000.2).

1.4 Both draft ES and now the final ES compound this basic error with overly optimistic assessments of the effectiveness of proposed mitigation and compensation measures unsupported (or even contradicted) by available scientific evidence. This is used for example to gloss over clear adverse effects to SSSIs and European Protected Species (i.e. bats) and fails to distinguish the clear demarcation lines between:

- residual adverse effects that cannot be mitigated and which require compensation;
- those residual adverse effects that can be compensated for (no net loss);
- those residual adverse effects that cannot be compensated for (net loss).

1.5 We are extremely disappointed that despite our criticisms of the draft ES, this flawed approach persists in the final ES. For example, on page 5, the NTS states:

*“Mitigation measures applied in the design of the Phase One project include... creating new habitats and other features of ecological value to compensate for unavoidable losses.”*

*And, “HS2 Ltd’s aim is to ensure that, during construction of the project, significant adverse environmental effects will either be avoided or mitigated.”*

1.6 Figure 3 confirms that compensation is seen by HS2 Ltd as the ultimate step towards mitigating effects, ignoring the fact that the Government clearly sees compensation as an option of last resort and *one that cannot be considered as part of mitigation*. For example, paragraph 118 of the National Planning Policy Framework (NPPF) says:

*“...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” [our emphasis].*

- 1.7 Volume 1 of the ES claims that development of the proposed scheme has been influenced by the Government’s commitment to sustainable development, as set out in the NPPF. This should include following the Government’s approach to mitigation and compensation.
- 1.8 We have raised this repeatedly as a serious concern in our responses to consultations on HS2, explaining why this is a problem and giving worked-through reasons and examples of how this has led to erroneous conclusions about impacts on specific sites,
- 1.9 This seemingly deliberate muddling of mitigation and compensation creates some serious problems with how the ES appraises impacts on some key nature conservation sites. For example, by counting compensation as just another form of mitigation, the ES has been able to conclude that there are no residual impacts on sites such as Mid Colne Valley SSSI or Helmdon Disused Railway SSSI. As noted above, we consider this is wrong and in conflict with the NPPF.
- 1.10 We have no capacity to scrutinise every part of the Environmental Statement (ES), even those sections relating to ecology, but we also strongly suspect that the way impacts on these two SSSIs have been assessed indicates a systemic problem with the appraisal of impacts on key biodiversity sites.
- 1.11 For a more detailed explanation of why we think this is a serious problem, with examples from specific sites, please see our comments on Volume 2, below. On each of the specific SSSIs we have studied, we consider the ES’s conclusions are wrong. The ES should instead conclude that an adverse effect on the SSSI cannot be ruled out and that, subject to satisfying the tests laid out in paragraph 118 of the NPPF, appropriate compensation is required. This will need agreement with Natural England.
- 1.12 Section 9.5 (Ecology)
- 1.13 The NTS states here that HS2 Ltd seeks to achieve no net loss in biodiversity. While this is a welcome starting point for any project, the NPPF goes further and makes it clear that Government policy is to move to a position of achieving net gains for biodiversity through the land use planning system (NPPF paragraph 9). Also, the statement in the non-technical summary is then undermined in paragraph 9.8.6 of Volume 1 (Introduction to the Environmental Statement and the Proposed Scheme) which adds the words “as far as reasonably practicable”. This is not acceptable for a high profile national infrastructure project: HS2 should set a new high standard (consistent with Government policy) for environmental protection and enhancement.
- 1.14 HS2 Ltd should commit unequivocally to the principle of delivering a net gain in biodiversity, and show clearly how this will be achieved. However, this should not be achieved by adopting a flawed version of the mitigation hierarchy that essentially dismisses clear biodiversity damage.

Comments on Volume 2 follow.

## 2. Comments on Volume 2: Community Forum Area reports

### 2.1 General comment on all CFA Reports

2.2 The ES states that the Proposed Scheme will seek to achieve no net loss in biodiversity at a route-wide level as far as reasonably practicable (Volume 1, paragraph 9.8.6). While Volume 3 summarises some gains and losses in habitats of principal importance, we still have no detailed information on gains and losses of specific habitats in specific places. Instead, apparently, we have to wait for HS2 Ltd to produce yet more documentation after submission of the Hybrid Bill to demonstrate whether or not the principle of no net loss will really be adhered to.

2.3 This is very unsatisfactory and requires interested parties to undertake an unnecessary paper chase to understand the effects of HS2 on biodiversity. At the very least at this stage, the figures provided within multiple separate paragraphs in Volume 3 and the twenty-four separate CFA reports of Volume 2 should have been tabulated together in one place to provide the necessary transparency.

### 2.4 CFA Report 7: Colne Valley

2.5 CFA Report 7 discusses potential effects on the Mid Colne Valley SSSI from construction and operation of HS2. This part of the ES raises serious concerns for us about the way effects have been appraised and the basis for certain conclusions, which serves to illustrate why we are concerned about the approach to mitigation and compensation defined in Volume 1 (see our comments above). This SSSI is one of the single most important designated sites that will be damaged by HS2, but it is also just one example of a site where the impacts of HS2 on biodiversity are misrepresented because of the way compensation is classed as a form of mitigation. Other examples from other CFA reports follow these comments.

2.6 Paragraph 7.4.63 concludes that there will be no significant adverse residual effect on the SSSI from construction, except for the permanent loss of 1 ha of ancient woodland. Paragraph 7.5.8 concludes there will be no significant adverse residual effects on the SSSI from operational use at all – and no mitigation is proposed, as a result. We do not believe either of these conclusions is valid, at least not with the degree of certainty HS2 Ltd exhibit.

2.7 Working back from the concluding paragraphs cited above, we believe that section 7.4 contains statements about likely construction and operational effects for which no evidence is provided. The following assertions are of particular concern:

- i. Paragraph 7.4.4: *“Loss of habitat will lead to a reduction of suitable nesting sites and therefore, over the five year construction period, a reduction in the abundance of birds within the SSSI, such as BoCC – red or amber list species such as song thrush, bullfinch and reed bunting, and also reed warbler, sedge warbler and garden warbler.”* This is a reasonable prediction. However, while some habitats lost due to construction requirements can be reinstated, permanent loss of some open water and marginal habitats (under the viaduct) is unavoidable and permanent, not restricted to the “five year construction period”.
- ii. Paragraph 7.4.5: *“the diversity and abundance of [the SSSI’s] wintering bird assemblage is likely to remain unaffected because... the main areas affected in the SSSI... support relatively low numbers of water birds and there are no species exclusively associated with these lakes”*

However, the Proposed Scheme will permanently destroy or shade an area of open water and fragment Korda Lake. The ES assumes, with no supporting evidence, that the undamaged and undisturbed parts of the SSSI will be able to accommodate all the displaced birds with no long term adverse effects either on the displaced birds or those already using the areas they will be displaced into. While the mitigation measures such as island creation and new marginal planting could help increase the “carrying capacity” of the remaining parts of the SSSI, quantifying the effectiveness of these measures is extremely difficult and certainly does not justify the current conclusion in the ES.

- iii. Paragraph 7.4.5 compounds the assumptions made above by noting there is an existing refuge area on Broadwater Lake, provided to protect birds from recreational activities (mainly sailing) on the lake. But the ES does not explain why this refuge area is considered large enough to hold birds displaced by sailing on Broadwater Lake as well as the birds that will be displaced from Korda Lake and Tilehouse Lake to the south. If HS2 Ltd are applying the precautionary principle as they claim, the ES should assume that all available suitable wetland habitats within the SSSI are already fully used by the maximum sustainable population of water birds and that there is no, or very limited, spare carrying capacity.
- iv. Again in paragraph 7.4.5, the suggestion that the wintering bird assemblage in the SSSI will be “unaffected” because lakes outside the SSSI will be unaffected, is a deeply worrying indication of weaknesses in the ES. It is fundamentally wrong, and in conflict with the mitigation hierarchy, to suggest there will be no significant effect on a protected site just because (to paraphrase in straighter wording) “there are plenty of other places for the birds to go”.
- v. And lastly, paragraph 7.4.5 claims that “*after construction standing water in Korda Lake, Harefield Moor Lake, Harefield No. 2 Lake and Savay Lake will be available again for wintering birds.*” This completely ignores the fact that Korda Lake will be bisected by the viaduct, turning a lake measuring 6.2 hectares into unequal portions of around 2ha and 2.6ha. We do not know of any scientific evidence to support the assumption that all birds will quickly habituate to high speed train noise or feed effectively (if at all) right under a viaduct. Very little research has been done anywhere on the effects of train noise on breeding birds, and none at all on wintering or breeding birds of open water or woodland, to our knowledge. The only useful reference we have found comes from research on the effects of conventional railways in the Netherlands on breeding birds of wet meadows, and this suggests that a significant permanent disturbance displacement effect on some species becomes evident at noise levels above around 40-45 dB(A) (Waterman et al, 2004)<sup>1</sup>. This compares unfavourably with map SV-05-010, which suggests that all of Korda Lake and Harefield Moor Lake, and about half of Broadwater Lake will be subject to daytime operational noise levels of at least 50dB, and at least 40dB at night.
- vi. Moving on, in paragraph 7.4.25, we see again the suggestion that despite permanent loss of habitat (of breeding birds, this time) in the SSSI, the conservation status of the overall

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<sup>1</sup> Waterman, E., Tulp, I., Reijnen, R., Krijgsveld, K. & ter Braak, C. (2004) *Noise disturbance of meadow birds by railway noise*. Internoise 2004. The 33rd International Congress and Exposition on Noise Control Engineering. Prague, Czech Republic.

breeding bird assemblage (inside the SSSI) will not be affected, “*because woodland and wetland habitats are abundant in the wider landscape*” (i.e. outside the SSSI). While we can agree that the fortunes of widespread, characteristic species of woodlands and wetlands will not be significantly affected at a wider landscape scale, this is not the same as discounting an impact on species populations or assemblages within a specific, nationally important designated site like Mid Colne Valley SSSI. Again, this is in conflict with the NPPF.

- vii. Paragraph 7.4.55 contradicts itself. It starts by noting that ancient woodland is irreplaceable, and then immediately claims the loss will be compensated for. The measures proposed, such as woodland soil translocation, may help speed up the rate at which new woodland begins to take on some characteristics of ancient woodland, but the first two sentences of 7.4.55 are basically incompatible. The ES needs to accept, here and at other places along the route where the loss of ancient woodland is unavoidable, that loss of ancient woodland cannot be compensated for on any meaningful human timescale, and adopt the best possible means of mitigation while accepting there will be a loss of this habitat.

## 2.8 CFA Report 12: Waddesdon and Quinton

- 2.9 CFA Report 12 discusses potential effects on Sheephouse Wood SSSI and on populations of bats (notably, Bechstein’s bats) from construction and operation of HS2. As with CFA report 7 and the Mid Colne Valley SSSI, this part of the ES causes us serious concern about the way effects have been appraised, and especially in this case the claims made for the effectiveness of some mitigation measures, which serve to illustrate further why we are concerned about the approach to mitigation and compensation defined in Volume 1 (see our comments above).
- 2.10 Paragraph 7.5.13 mentions a mitigation structure to help reduce bat collision mortality. This is described as a “box shaped enclosure” designed to exclude bats from the airspace along 800m of the line adjacent to Sheephouse Wood SSSI, but no further details of the design are given. Unlike in the draft ES, there is now no reference to this performing any noise mitigation function in relation to the adjacent SSSI. The relevant map (SV-05-027a) suggests about 20% of the SSSI will be subject to daytime noise levels of >65dBa, and all of it subject to levels of >50dBA. This SSSI is currently not close to any significant noise source so the change against baseline is significant. Noise impacts on breeding birds, bats etc may be proportionately more significant than in an already noisy area. We strongly suggest the structure should incorporate noise mitigation at least on the side adjacent to the SSSI.
- 2.11 Another issue of concern about ecological mitigation planned in this section of route are the “overbridges” to be built in part to preserve habitat connectivity and flightlines for bats. We are pleased to see that the location and general design (in plan) of these features have now been included on the relevant maps. However, most if not all of these are apparently to be “multifunctional” – some carry roads as well as narrow habitat strips, and all carry rights of way of some kind. Proof of the effectiveness of habitat bridges for any wildlife, let alone bats, is hard to find. For example, van der Ree et al (2007)<sup>2</sup> reviewed 123 international studies of the use

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<sup>2</sup> Van der Ree, R; van der Grift, E; Gulle, N; Holland, K; Mata, C and Suarez, F (2007). *Overcoming the barrier effect of roads – how effective are mitigation strategies? An international review of the use and*

and effectiveness of underpasses and overpasses designed to increase the permeability of roads for wildlife. Only two studies demonstrated a positive effect for the population and thus overall, the effectiveness of such mitigation measures at reducing the risk of population extinction remains unclear.

- 2.12 Even if they do prove to be effective in the long term, and there are enough of them planned, and they are in the right place, and their multifunctional nature will not compromise their ecological function, there remains a significant mismatch in the timing of delivery of a combined set of mitigation measures to preserve habitat connectivity for Bechstein's bats. Paragraph 7.4.20 notes that overbridges and underpasses alone will not preserve connectivity between roosts and foraging areas – habitat creation is necessary too, as the ES explains later in 7.4.41.
- 2.13 It is hard to know whether populations of Bechstein's and other bat species will be able to persist in the Bernwood Forest area in the long period of time between construction of the Proposed Scheme (including overbridges) and maturation of the linear habitat corridors that are in part intended to "funnel" bats towards safe crossing points or divert them away from the route. The CFA report refers to a period of 10-15 years for hedgerow-type habitat corridors to become mature, though not specifically in relation to their ecological function for bats. Regarding Bechstein's bats in particular, the Bat Conservation Trust advises woodland managers that an ideal Bechstein's bat woodland is of uneven age, structurally diverse semi-natural or ancient woodland, with a high number of oaks, of a minimum 40-50 hectares, with a dense mixed species understory.<sup>3</sup> Achieving this quality of habitat through new planting in any timescale measuring less than decades is clearly impossible. The ES should acknowledge this reality and not take the overly optimistic view it currently does.
- 2.14 In light of this, the likelihood seems remote that bats in the Bernwood Forest area, especially Bechstein's bats, will sustain their population and not suffer a decline that will take a long time to recover from (assuming that is possible), during the interim period between construction of the route and maturation of compensatory habitats. Therefore we strongly recommend that the ES's conclusion be changed to accept that an adverse effect on Sheephouse Wood SSSI and Bechstein's bat populations cannot be ruled out.
- 2.15 Our own criticisms of the ES in this matter have very recently received independent and indirect endorsement from academic specialists in the field, Dr Anna Berthinussen & Professor John Altringham of the University of Leeds. Their report, commissioned by the Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust (BBOWT), includes the summary, "*...we have serious concerns about the viability of Bechstein's bat colonies in the Bernwood forest area should the proposed HS2 development go ahead as planned. There are numerous fundamental issues and major flaws in the ES... As a result local Bechstein's bat populations will be vulnerable and at risk of extinction as a result of the proposed scheme.*"

## 2.16 CFA Report 14: Newton Purcell to Brackley

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*effectiveness of underpasses and overpasses designed to increase the permeability of roads for wildlife.*

<sup>3</sup> [http://www.bats.org.uk/data/files/publications/Bechsteins\\_bat\\_woodland\\_guide\\_doc\\_final.pdf](http://www.bats.org.uk/data/files/publications/Bechsteins_bat_woodland_guide_doc_final.pdf)

- 2.17 CFA Report 14 discusses potential effects on Helmdon Disused Railway SSSI from construction and operation of HS2. As with CFA reports 7 and 14 discussed above, this part of the ES causes us concern about the way effects have been appraised and serves to illustrate further why we are concerned about the approach to mitigation and compensation defined in Volume 1 (see our comment above).
- 2.18 We are pleased to note that some of more extraordinary claims made in the draft ES for the functional effects and maturation speed of new compensatory calcareous grassland have been removed. However, CFA report 14 still appears to contain some contradictory statements. Paragraph 7.5.1 now recognises a “permanent, adverse effect on the integrity of the SSSI that is significant at a national level” based on partial destruction and fragmentation. However, the conclusion about “residual effects” in 7.5.57 still says, “The mitigation, compensation and enhancement measures described above reduce the effects to a level that is not significant [including on the SSSI]”. We consider that these cannot be reconciled and that paragraph 7.5.1 is the correct assessment.
- 2.19 Given that HS2 is in a cutting at the point it crosses the SSSI, and the SSSI itself is linear in nature, this is somewhere that a habitat overbridge would almost certainly serve a useful mitigation function, rejoining the two parts of the SSSI. Such a link would also help facilitate improved management in future, whether by machine or by introducing grazing animals, to suppress scrub. Given also that this is one of only two nationally important designated sites directly affected by the Proposed Scheme, we strongly recommend that this measure be implemented alongside the proposed compensatory grassland creation.
- 2.20 As noted above, paragraph 7.5.57 claims that taking into account mitigation and compensation measures (including creation of approximately 7ha of lowland calcareous grassland and scrub adjacent to the remaining larger part of the SSSI), effects on the SSSI will be reduced to a non-significant level. As was the case at Mid Colne Valley SSSI dealt with in CFA report 7, this is another example of how defining compensation as just another form of mitigation has led to a serious misrepresentation of the impacts of the Proposed Scheme. Therefore, the ES should conclude there is a permanent adverse effect on the SSSI requiring compensation.
- 2.21 Furthermore, we note HS2 Ltd do not say how long it will take for compensation for damage to this SSSI to become fully effective. The original suggestion in the draft ES was that it would take just 5-10 years. By contrast, the available scientific research suggests that calcareous grassland habitat creation projects take a very long time to approach mature sites in terms of the quality and diversity of their plant communities. For example, Fagan et al (2008)<sup>4</sup> considered the following hypotheses: (i) Are plant communities of restoration sites becoming more like those of mature calcareous grassland? (ii) How long does the restoration process take? (iii) Are there any environmental filters that hinder the process? (iv) Is there a difference in plant attributes between restored and ancient grassland communities, and between restored communities of different ages?
- 2.22 Fagan et al found that on the whole, plant communities of older restoration sites are more like those of their reference sites than younger restoration sites, although in general, **the process**

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<sup>4</sup> Fagan, K.C., Pywell, R.F., Bullock, J.M, and Marrs, R.H. (2008) *Do restored calcareous grasslands on former arable fields resemble ancient targets? The effect of time, methods and environment on outcomes*. Journal of Applied Ecology 45, 1293–1303.



**exceeds the 60 years covered by their study.** They also found that on average, phosphorus levels (likely to be a limiting factor in calcareous grassland establishment) may need around 50 years to return to an “acceptable” level in order for calcareous grassland to become species rich, following the cessation of arable farming.

- 2.23 So, while the habitat creation in this location should proceed, the decades-long timescale needed before the new habitat approaches maturity is another strong argument in favour of a habitat overbridge at this location, which would at least preserve some level of connectivity in the much shorter term.

Comments on Volume 3 follow.

### **3. Comments on Volume 3: Route-wide effects**

- 3.1 We have comments on this volume relating to climate (including greenhouse gas emissions) and ecology.

#### **3.2 Section 5: Climate**

- 3.3 Climate change is one of the greatest threats to humans and to nature. Indeed, climate change risks increasing the number of species ‘committed to extinction’ this century up to 100 times the rate it might otherwise be. It is essential that we make rapid substantial cuts in emissions to stand a chance of keeping climate change to safe levels. The RSPB therefore supports this Government’s commitments under the Climate Change Act (2008) and its aim to hold the increase in global temperature below 2 degrees Celsius, as stated in the Copenhagen Accord (2010)

- 3.4 The RSPB is therefore disappointed that the expected net overall impact of the scheme over 60 years is an increase in carbon emissions. We recognise that the impact will be net positive over 120 years, but this is outside a meaningful timeframe for addressing dangerous levels of climate change.

#### **3.5 General comments**

- 3.6 We believe that the Proposed Scheme is not currently fulfilling its potential to be part of a low carbon transport system. We recognise that the Proposed Scheme represents one of the lowest carbon transport solutions compared to other potential new infrastructure such as road, air and classic rail. However, we believe that the Government and HS2 Ltd could and should go much further in putting forward a package of policy and practical measures that would allow HSR to fulfil its role as part of a low carbon transport system of the future.
- 3.7 We believe it is in HS2 Ltd’s interests to go as far as possible to delivering a low carbon project and to use its considerable influence to persuade Government to put in place the measures necessary to support the development of a scheme with the lowest possible carbon impact. HS2 Ltd should additionally be looking to maximise the opportunities from those elements of the project that lie within its control, notably maximising the transfer of freight from road to rail, siting of city centre stations plus connections to existing transport networks, and modifying top operating speed. Below are specific comments relating to the ES.

### 3.8 Specific comments

- 3.9 Construction: the RSPB believes it is important that HS2 Ltd seeks to reduce as far as possible the embedded carbon cost of construction through, for example, careful design and alignment of bridges and tunnels to minimise spoil (though not at the expense of maximising the effectiveness of mitigation for the local environment and communities), and by maximising the use of recycled aggregates, steel and other materials.
- 3.10 Grid decarbonisation: the ES relies on the assumption that the grid will be decarbonised. The RSPB views this as an essential measure, but it is an ambitious undertaking and failure to achieve this would significantly alter the carbon picture for HS2. The Committee on Climate Change (CCC) has recommended an ambitious decarbonisation trajectory for the UK's electricity sector which would result in the average HSR carbon emissions per passenger reducing by 92% by 2050. The RSPB, together with CPRE and the Campaign for Better Transport, commissioned research<sup>5</sup> to identify objectively the key factors that will determine HS2's contribution to reductions in the UK's carbon emissions and the steps that need to be taken to ensure genuine emissions reductions take place. This research found that a slower but still relatively ambitious reduction in the carbon intensity of electricity could see the total HS2 carbon savings in the base scenario reduced by nearly one-third. A scenario in which there is a second 'dash for gas' and therefore slower decarbonisation would reduce the HS2 carbon benefits by two-thirds. We believe HS2 Ltd should be conducting and publishing sensitivity analyses, such as those carried out in the research cited above, in order to enable all stakeholders to understand the carbon implications of HS2 in a context where full grid decarbonisation is not achieved.
- 3.11 Freight and use of the existing rail network: the ES assesses the potential for emissions reductions arising from the increased use of rail for freight, resulting in emissions reductions. The ES adopts conservative assumptions to calculate the emissions reduction potential but we believe that instead, the ES should have shown the range of potential savings available. By showing what further reductions are possible beyond the conservative scenario, this will demonstrate the benefits of putting in place policies that maximise potential savings and deliver carbon benefit at the top end of the range.
- 3.12 While HS2 can play a valuable role in increasing the overall capacity of the UK rail network, in order for those benefits to be delivered for rail freight, a number of steps need to be urgently taken:
- Ensuring the HS1/2 connection is fit for purpose and does not adversely affect freight services on the existing network;
  - Ensuring that sufficient released capacity is allocated to help meet expected growth forecasts. The current proposals for just 10 additional trains from both phases of the project seem to be entirely inadequate;
  - Ensuring that, between the opening of Phases 1 and 2, the West Coast Main Line (WCML) north of Handsacre Junction is able to meet expected freight and passenger demands as well as additional HS2 services;

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<sup>5</sup> Greengauge 21 (2012) The carbon impacts of High Speed 2. <http://www.greengauge21.net/publications/the-carbon-impacts-of-hs2/>

- Maximising the use of rail freight during the construction phase, and minimising the loss of rail freight facilities through land take;
- Designing HS2 to be freight capable as a strategic provision.

- 3.13 In the Greengauge 21 research cited above it was estimated that HS2 carbon savings could be increased by 8% by fully using spare WCML capacity for enhanced commuter or inter-regional passenger services. Even more benefits could be delivered with policies that ensure greater occupancy of these medium-distance trains. This highlights the value in ensuring that future rail franchises are set up so that they are able to unlock the spin-off benefits of HS2. However, the carbon savings from using the additional unclaimed capacity of three train paths per hour in each direction for freight are considerably larger still, adding 55% to the direct carbon savings from HS2. This is such a strong advantage that it would be worthwhile examining complementary measures to ensure that a major switch from HGV road haulage to rail freight is achieved as a consequence of HS2.
- 3.14 Top speed: altering the top speed can have a significant impact on emissions. The potential 7% reduction in emissions identified in the ES should not be ignored as a meaningful contribution alongside other measures. However, the Greengauge 21 research referenced above, showed that further reductions are achievable and that reducing the top speed of HS2 from 360km/h to 300km/h could reduce energy consumption by 19%. In the early years of HS2 operation, before the electricity supply is substantially decarbonised (say, before the 2030s), the carbon impacts of HS2 would be improved by adopting this lower top operating speed. Then, as electrical power generation is more fully decarbonised and the HSR network is extended, the journey time improvements on HS2 become even more important in delivering mode shift, and so a top speed of 360km/h is more likely to be needed and justified by the carbon savings from reduced air and private car travel.
- 3.15: Siting of city centre stations: the number and placement of stations, particularly in relation to airports and city centre transport hubs, will be an important factor in determining whether HS2 can fulfil its potential to reduce carbon emissions from the UK transport sector. The research commissioned by RSPB and others (cited in the section above) concluded that HS2 and the wider HSR network should incorporate city centre stations rather than parkway stations where feasible. City centre stations are estimated to be around 7% more efficient in carbon terms than parkway stations, even when only considering the direct impacts of HSR travel. To this extent, it is disappointing to see the plans for parkway stations in the Green Belt outside Birmingham and Manchester, whereas a station in Sheffield city centre will deliver greater carbon efficiency than one at Meadowhall. Equally, while a station located at Toton may be a mid-point between Nottingham and Derby, spurs from the high speed line to the city centre stations would significantly enhance the connectivity of these cities to HS2. Connections to the existing local tram network should also be factored in.
- 3.16 The effect of local access trips to HSR stations, which can be made more readily by sustainable travel modes to city centre stations, will only increase this benefit. All HS2 stations need to be designed around high modal shares for sustainable access travel modes and supported by planning policies that deliver sustainable patterns of land use.

- 3.17 Tree planting: ancient woodlands are irreplaceable over any meaningful timescale, and avoiding their loss must always be the primary aim. While there maybe short-medium term carbon benefits, we do not accept that new planting will mitigate the impact of ancient woodland loss to wildlife, cultural heritage and local communities over any reasonable timescale. It must also be recognised that existing semi-natural woodland that is not on the ancient woodland inventory, can also be nationally and locally important for Government priority species, and their loss must not be overlooked because of their non ancient status.
- 3.18 It is important to note that planting trees to reduce carbon does not permanently remove emissions from the atmosphere as those trees have a limited lifespan and this should not be treated as an alternative to making emissions reductions elsewhere. In addition, any net positive carbon benefits of woodland creation will depend on a number of factors including soil type, woodland management methods and use of any products derived from the woodland. Maximising carbon values can also have significant tradeoffs on other important ecosystem services (non-market) such as landscape, biodiversity and access. Planting must be carefully designed and targeted in order to provide high levels of multiple public benefits.
- 3.19 Where tree planting does take place, it must be done in a way that benefits and does not harm biodiversity. This includes avoiding existing priority open habitats, such as lowland heathland, chalk grassland and open ground sites for species such as breeding waders, farmland birds and high wildlife value flowering plants. It is essential that a Forestry EIA is undertaken before any new planting is undertaken and that it meets the UK Forestry Standard and associated guidelines as a minimum. A mix of native species, appropriate to local site ecological conditions should be used. Consideration should be given to woodland design for priority species and habitats<sup>6</sup>, including ongoing management and protection, tree species choice, planting density/opportunities for natural regeneration and proximity/connectivity to other long established woodland to facilitate species recolonisation. This should be based on the latest evidence and advice<sup>7</sup>
- 3.20 Reliance on EU Emissions Trading Scheme (ETS): the ES references the role that the ETS will play. However, while the EU ETS will indeed theoretically cover HS2 emissions, it is important to note that, due to extremely low carbon prices and flaws in the way the ETS was established, the carbon market is not operating effectively, undermining its efficacy. This needs to be acknowledged and taken into account in all current analysis and until the ETS is operating effectively.
- 3.21 Industry decarbonisation: it is not clear whether the aspiration to reduce construction industry emissions by 50% has been included in the ES's calculation of the climate impact. It would be wrong to rely solely on industry aspirations.
- 3.22 Low carbon focus group: we welcome the establishment of a low carbon focus group to explore sustainable construction options and to help define HS2 Ltd's design approach to ensure efficient delivery, innovation and the realisation of carbon savings. We would urge this group to give further consideration to the points raised in this response.

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<sup>6</sup> Section 41 of The Natural Environment and Rural Communities (NERC) Act, 2006

<sup>7</sup> For example: Blackesley, D, Buckley, GP and Fitzgerald, JD. 2013. Realising the wildlife potential of new native woodland, East Malling Research, East Malling.

### 3.23 Wider policy changes

3.24 Although the RSPB acknowledges that the policy framework extends beyond the remit of this ES or indeed HS2 Ltd, changes to this will also be necessary to enable HS2 to fulfil its potential as a low carbon transport option and thus fulfil an important aspect of public acceptability. We urge HS2 Ltd to emphasise these points in discussions with Government. While it is clear from the ES that the extension of HS2 further north will lead to enhanced carbon gains, the Greenguage 21 research cited above highlighted three additional wider policies that could have the greatest effect in terms of maximising the potential of HS2 to reduce carbon emissions:

- **Ensuring the rate of electricity decarbonisation set out by the Committee on Climate Change is delivered.** The Committee on Climate Change (CCC) has recommended an ambitious decarbonisation trajectory for the UK's electricity sector which would result in the average HSR carbon emissions per passenger reducing by 92% by 2050. A slower but still relatively ambitious reduction in the carbon intensity of electricity could see the total HS2 carbon savings in the base scenario reduced by nearly one-third. A scenario in which there is a second 'dash for gas' and therefore slower decarbonisation would reduce the HS2 carbon benefits by two-thirds.
- **Management and regulation of the motorway and trunk road network to reflect the external costs of driving.** Policies to manage the capacity and use of the strategic road network, including through pricing mechanisms, could increase the carbon savings of HS2 and would help ensure that the benefits of mode shift to HS2 are sustained. It is not possible to optimise the carbon savings by looking at individual travel modes in isolation; management of their use needs to be considered together.
- **Transport and spatial planning policies to encourage sustainable travel choices.** Ensuring that HS2 serves locations of high demand density and locations where there is high capacity public transport should be a planning aim. The accessibility boost that HSR can provide to cities is a unique quality. It can be used to magnify the carbon benefits of HSR if complementary policies on spatial development seek to foster an intensification of development in urban areas so as to reduce trip distances and the need for private car use.

3.25 In addition to the last point, a further way of promoting low carbon development is for local authorities to site new development near existing railway lines such that they can be the focus of low carbon transport.

3.26 Further policy changes that the RSPB considers are necessary for HS2 to deliver on its carbon reduction potential are:

- Ensuring significant modal shift from flights from UK airports and road travel onto the HSR network. We see stopping any further expansion of existing aviation capacity as an important step. Additional measures will be needed such as:
  - A policy that "retires" aviation slots permanently as they are freed up from journeys switching to rail
  - A general moratorium on new/wider motorways and airport expansion.

- Prioritising investment in existing public and local transport and ensuring that HSR does not draw funding away from these;
- Using pricing to encourage people to choose rail: lower train fares and increased taxes on short distance internal flights are needed.

### 3.27 Section 8: Ecology

3.28 We believe the ES tends to play down some impacts on ecology and overstates the certainty with which some mitigation and compensation measures will work. The fact that there will be adverse impacts on features of nature conservation interest comes as no surprise, from a proposal of this enormous scale and complexity. The Government has made its commitment to delivering High Speed Rail for the UK quite clear. What we expect under the circumstances, is that where impacts are possible or likely, and the science is unclear or conservative, the ES allows for greater uncertainty in its predictions and the Government follows best practice guidance dealing with those impacts and uncertainties.

#### 3.29 Designated sites

3.30 We are pleased to note that no significant effects are likely on sites of international importance for nature conservation (paragraphs 8.1.4-8.1.5 of Volume 3).

3.31 We have already noted with concern the likely partial destruction, fragmentation and disturbance of Mid Colne Valley SSSI and Helmdon Disused Railway SSSI, in our comments on Volume 2 CFA reports 7 and 14 respectively. For reasons already stated, we do not believe that the conclusions the ES draws about impacts on these SSSIs (that no significant residual effect on these sites is likely) are valid or supported by some of the available scientific evidence. Therefore, the ES should be amended to conclude that there will be adverse effects on these SSSIs and any other statutory or non-statutory wildlife sites where a similarly flawed approach to the mitigation hierarchy has been adopted.

3.32 For example, we do not believe HS2 Ltd can conclude with certainty that all the water birds in the Mid Colne Valley SSSI will fully habituate to the operational use of HS2, and it is entirely wrong to suggest impacts on this SSSI are not significant because (to paraphrase in straighter English) "there are plenty of other places the birds can go". **In the case of Helmdon Disused Railway SSSI we strongly recommend that a habitat overbridge is provided to reconnect the two parts of this linear site**, and we believe the ES needs to reflect the true length of time it is likely to take before new compensatory calcareous grassland approaches maturity.

#### 3.33 Habitats

3.34 We are disappointed to see that full details about the areas of habitats likely to be lost and gained as a result of HS2 *still* have not been provided: that instead, stakeholders have to wait until after submission of the Hybrid Bill to see further documentation. Presumably, no further opportunity to comment on this new information will be given. In the absence of such information it is very hard to see how anyone can claim that this ES is complete to a reasonable standard.

3.35 Even the limited information provided in the ES about habitat gains and losses could have been presented more clearly. Various loss and gain figures for habitats of principal importance are

scattered throughout the section on habitats, and some more detailed figures are in each of the twenty-four CFA reports. It should have been a simple proposition for HS2 Ltd to tabulate these figures in one place, as we specifically asked for in our response to the draft ES. At present, it presents the reader with a complex and totally unnecessary paper chase to understand the full impacts of the scheme on biodiversity.

3.36 Species – bats

3.37 The science to demonstrate that habitat overbridges or underpasses will mitigate the effects of habitat severance and mitigate collision risk on bats is highly equivocal, as very recently confirmed by leading academic experts in the field<sup>8</sup>. Even if these bridges are effective, there are enough of them, they are in the right places and will not be ecologically compromised by their “multifunctional” nature, there is still the problem of bridging the temporal gap between construction of these links, the planting of new habitat corridors, and the maturation of those habitat corridors. Bat species that are woodland specialists (e.g. Bechstein’s bats) may be particularly at risk. Taking all these factors into account the ES cannot be so certain there will be no significant residual effects on the conservation status of bats (paragraph 8.1.44).

3.38 Species – yellow wagtail

3.39 We have noted paragraph 8.1.56, which predicts a route-wide effect on yellow wagtails that will be significant at the county/metropolitan level. We support any measures to reduce these impacts at a local scale through habitat creation and management. However, it is worth noting that yellow wagtails are estimated to have declined by 75% between 1970 and 2009 across all types of breeding habitat in the UK. If we are to have any hope of reversing the ongoing population decline of this species, we need to employ a targeted conservation effort in their main breeding sites across the UK’s agricultural landscape. Clearly, this goes far beyond the scope of a single project, even one as large as HS2, to accomplish.

3.40 Yellow wagtails are just one of many widespread farmland animal and plant species of that have suffered significant long term declines because of changes to agriculture. In addition to local mitigation and compensation measures linked to HS2, the RSPB calls on the Government to use the scientific evidence that demonstrates that certain high level stewardship options are an effective way to help farmland wildlife to recover; to fund these options adequately to make them available to farmers in appropriate areas; and to ensure that bodies like Natural England have the capacity to deliver high quality advice to those farmers to help them implement these options with maximum impact.

3.41 Species – barn owls

3.42 We have noted paragraph 8.1.57, which predicts that “without mitigation”, a route-wide effect on barn owls will result that will be significant at a national level due to collision mortality. While we welcome proposals to compensate for this by working with landowners to place new nesting boxes further than 1.5km from the Proposed Scheme, this measure on its own is unlikely to be effective at maintaining, let alone increasing, barn owl numbers in the wider landscape.

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<sup>8</sup> Berthinussen, A. and Altringham, J (2014). *Appraisal of HS2 Ltd Environmental Statement in relation to the bat community in the Bernwood Forest area, with particular reference to Bechstein’s bat*. Report for Berks, Bucks, Oxon Wildlife Trust (BBOWT) by the University of Leeds.

Absence of nesting sites can be a limiting factor on population size, but the Barn Owl Trust's advice shows how important high quality foraging habitat is, alongside provision of nest sites. However, we have not been able to find any mention in the ES of rough grassland areas likely to be lost or gained.

- 3.43 The Barn Owl Trust's website ([www.barnowltrust.org.uk](http://www.barnowltrust.org.uk)) contains extensive advice on creating optimum foraging habitat for barn owls in farmed landscapes (essentially, areas of rough grassland on field margins and in less productive areas). HS2 Ltd need to put in place measures to create suitable foraging habitat, compensating for that lost or made unsuitable (e.g. by nearby passage of trains) as a result of the Proposed Scheme. These areas of habitat must be created in places where nesting boxes are also provided, far enough from HS2 to be reasonably sure collision mortality risks are minimised. Also, we have seen no discussion of whether it might be necessary to move any existing nest boxes further from HS2. Leaving existing boxes to be occupied very close by could undermine efforts to increase populations further away, by creating a population "sink".

#### **4. Comments on Volume 4: Off-route effects**

- 4.1 We have no comments on Volume 4.

#### **5. Comments on Volume 5: Appendices and map-books**

- 5.1 We have not had the time to examine all the map-books closely except in relation to the three SSSIs mentioned above. Our comments on the CFA reports cross refer to maps where appropriate.

- 5.2 We have some comments on the modified approach to biodiversity offsetting, as follows:

#### **5.3 Comments on the Ecology Technical note – Methodology for demonstrating no net loss in biodiversity”<sup>9</sup>**

- 5.4 The RSPB welcomes HS2 Ltd's aim to ensure that there is a no net loss of biodiversity at a route-wide level set out in paragraph 1.1.1 of the Technical Note. However, for reasons set out elsewhere in our response, we consider the approach to mitigation and compensation in the main ES is fundamentally flawed and in conflict with both the NPPF as well as this Technical Note.

- 5.5 At paragraph 1.2.2 the Technical Note needs to acknowledge the known weaknesses in the Defra offsetting metrics in dealing with impacts on species in general and specialist species in particular. Reliance on the Defra metrics to demonstrate "no net loss" will underestimate the impacts on species of conservation concern. This should be acknowledged and addressed in specific places elsewhere in the ES, e.g. in CFA report 12 where impacts on Bechstein's bats are discussed (refer to our comments on Volume 2 above).

- 5.6 In November 2013, the RSPB made representations to Defra on the Green Paper on Biodiversity Offsetting. This is attached at Annex 1 to our response, so that HS2 Ltd can see our detailed criticisms of that methodology.

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<sup>9</sup> Volume 5, scope and methodology report addendum CT-001-000.2 (ES 3.5.0.15.2), pp364-394.  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/260153/Vol5\\_Scope\\_and\\_methodology\\_report\\_addendum\\_CT-001-000.2.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/260153/Vol5_Scope_and_methodology_report_addendum_CT-001-000.2.pdf)



- 5.7 The diagram at paragraph 1.3.1 of the Technical Note sets out the mitigation hierarchy. The RSPB is generally happy with this representation but strongly recommends the following amendments, which should be followed through in the assessment of impacts:
- **Reduce/mitigate:** should add reference to damage as well as loss to include indirect impacts that may not result in direct or total loss of habitat;
  - **Compensate:** first a better example should be included given the impossibility (acknowledged elsewhere in the ES) of compensating for the loss of some kinds of woodland. This is especially true for ancient woodland which is effectively irreplaceable. Second, reference should be made here to indirect adverse effects, not just losses.
- 5.8 We welcome the statement at paragraph 1.3.4 that consideration of compensation should be clearly separated from that of mitigation. We therefore consider it extremely unfortunate that the ES completely fails to do this and conflates the two in order to be able to conclude “no residual effect” on nationally-important SSSIs and probably other non-statutory sites too (see our comments on Volume 2 above, especially in relation to CFA reports 7 and 14).
- 5.9 At paragraph 1.5.2, the Technical Note sets out key amendments it has adopted to the Defra offsetting pilot methodology. The first amendment is to add a “very high” score to take account of s41 habitats of principal importance which “*cannot be adequately re-created if lost*”. In paragraph 3.1.3 the relevant habitats are listed, including ancient woodland. This approach raises serious concerns for the RSPB as within the main ES, it has been used effectively to deny a net loss of irreplaceable habitats that we do not know how to create effectively, especially ancient woodland. By definition, no matter what multiplier is applied in the case of irreplaceable habitats, new habitat creation cannot overcome our basic inability to compensate for the loss of such habitats. Such net losses should be clearly acknowledged, not concealed by false accounting.
- 5.10 Therefore, the ES should treat irreplaceable habitats separately and where loss is unavoidable, acknowledge that a net loss is similarly unavoidable, for that irreplaceable habitat in that location. This need not dictate that the Proposed Scheme will result in a net loss to biodiversity overall, because in the case of the large areas of lower-value habitats that are unavoidably lost it is possible to “trade up”, ensuring that compensation is in the form of higher value habitats that can be created on a reasonable timescale. To some extent, it is also possible in some cases to provide a measure of compensation by improving the condition existing areas of semi-natural habitat, like neglected ancient woodland or PAWS<sup>10</sup> not otherwise affected by the Proposed Scheme. However, such compensation must be additional to actions already required by other legislation, e.g. the legal requirements on owners/occupiers of statutory nature conservation sites to achieve favourable condition.
- 5.11 Paragraph 1.5.8 states that a standard implementation of the mitigation hierarchy has been applied in respect of predicted damage to SSSIs. We would indeed welcome the stated approach in paragraph 1.5.8 being carried through to the ES. However we fundamentally disagree with the accuracy of this statement as it is not borne out by the ES itself where the mitigation hierarchy has been misapplied to gloss over residual impacts on SSSIs. Our reasons for this disagreement are set out elsewhere in this response – see especially our comments on Volume 2, CFA Reports 7 and 14, above.

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<sup>10</sup> “Plantation on Ancient Woodland Sites” – see <http://www.forestry.gov.uk/fr/INFD-5W2G8Q>

- 5.12 We consider it would be more appropriate not to include impacts on SSSIs within the no net loss calculations that use the Defra offsetting metrics, as these metrics are not designed for such use. Instead, we recommend that a separate and clear audit trail of the impacts on SSSIs is provided, identifying those:
- residual adverse effects that cannot be mitigated and which require compensation;
  - those residual adverse effects that can be compensated for (no net loss);
  - those residual adverse effects that cannot be compensated for (net loss).
- 5.13 Paragraph 3.2.1 of the Technical Note describes the use of the Higher Level Stewardship three-point condition scale to assess habitat condition. As set out in paragraphs 28-33 of our response to the Green Paper on Biodiversity Offsetting (see Annex 1 attached), the RSPB considers the method used for SSSI Common Standards Monitoring (CSM) to be a more appropriate base from which to build the actual criteria for assessment than the HLS condition assessment tool. The HLS method is too limited in scope and does not allow a proper assessment of the quality of the site. For further detail and examples, refer to Annex 1.