From:	david alexander
To:	marc.turner@naturalengland.org.uk; marian.spain@naturalengland.org.uk
Subject:	FW: RHS Garden Wisley and M25 Junction 10 proposals by Highways England.
Date:	15 April 2020 16:19:14
Attachments:	200401 RHS Letter to Natural England.pdf Annex 03.04.20.pdf 200403 RHS Letter to Natural England.pdf RE RHS Garden Wisley and M25 Junction 10 proposals by Highways England..msg
Importance:	High

Dear Ms Spain and Mr Turner,

I refer to my letters and supporting Annex by Freeths LLP sent to you on 1st April and 4th April 2020, attached. Natural England (Jessica Bardett) acknowledged receipt of my letter on the same day but we have heard nothing further from you since then.

The RHS remains very keen to discuss my letter and its contents with Natural England. Please could you come back to me by the end of this week at the latest, to let me know if there will be an opportunity to discuss this. I would suggest that we have a conversation next week.

We note in this context that we have received from the Planning Inspectorate their "Report on the Implications for European Sites" (RIES) document, which can be found at:
https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010030/TR010030-000826-2510-Report%20on%20the%20Implications%20for%20European%20Sites%20(RIES).pdf

We will be pointing out to the Examining Authority at Deadline 7 on 20th April by copy of this letter that our Deadline 6 information (including our letter to you of 1st April 2020 and the Freeths LLP Annex) is not accounted for in this RIES document, since the RIES document only covers the DCO work up to Deadline 5a. Obviously all information relevant to the HRA for this project since Deadline 5a will need to be taken into account by NE when it responds to the RIES and by the Secretary of State when this matter is determined.

Yours,

David Alexander MA MRICS
Principal Surveyor
davidalexander@rhs.org.uk
Tel: 01483 479729
Mob: 07970 138338
Royal Horticultural Society
RHS Garden Wisley
Woking
Surrey GU23 6QB
rhs.org.uk
Reg charity no. 222879/SC038262

From: david alexander

Sent: 03 April 2020 15:38

To: 'marc.tuner@naturalengland.org.uk' <marc.tuner@naturalengland.org.uk>

Cc: 'marian.spain@naturalengland.org.uk' <marian.spain@naturalengland.org.uk>; Richard Max <Richard@RichardMax.co.uk>

Subject: RHS Garden Wisley and M25 Junction 10 proposals by Highways England.

Importance: High

Dear Mr Turner,

Following my recent letter of 1st April to your CEO, attached, I now attach a further letter and annexure detailing our concerns, which will also be provided to the DCO Examining Authority as part of our deadline 6 submission today.

We look forward to hearing from you as we are keen to reach an agreed position on this matter.

Yours

David Alexander MA MRICS
Principal Surveyor
davidalexander@rhs.org.uk
Tel: 01483 479729
Mob: 07970 138338

Royal Horticultural Society
RHS Garden Wisley
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Reg charity no. 222879/SC038262

The Royal Horticultural Society is the UK's leading gardening charity. We aim to enrich everyone's life through plants, and make the UK a greener and more beautiful place. This vision, expressed through our Greening Great Britain campaign, underpins all that we do – from inspirational gardens and shows, through our scientific research, to our education and community programmes. We are committed to inspiring everyone to grow.

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From:	Bardet, Jessica
To:	david alexander
Cc:	Juniper, Tony; Sue Biggs; Alistair Griffiths
Subject:	RE: RHS Garden Wisley and M25 Junction 10 proposals by Highways England.
Date:	01 April 2020 17:13:18

Dear David

I confirm receipt of your letter with thanks and Natural England will respond in due course.

Many thanks

Jess

Jessica Bardet
Senior Adviser to the Chief Executive
Governance Team
Natural England
Tel: 020 802 66452 Mob: 0782 593 2580
Please send documents to me by email, not post, while our offices are closed
www.gov.uk/natural-england

We are here to secure a healthy natural environment for people to enjoy, where wildlife is protected and England's traditional landscapes are safeguarded for future generations.

In an effort to reduce Natural England's carbon footprint, I will wherever possible, avoid travelling to meetings and attend via audio, video or web conferencing.

From: david alexander [mailto:davidalexander@rhs.org.uk]
Sent: 01 April 2020 15:20
To: Spain, Marian <Marian.Spain@naturalengland.org.uk>
Cc: Juniper, Tony <Tony.Juniper@naturalengland.org.uk>; Sue Biggs <suebiggs@rhs.org.uk>; Alistair Griffiths <alistairgriffiths@rhs.org.uk>
Subject: RHS Garden Wisley and M25 Junction 10 proposals by Highways England.

Dear Ms Spain,
I would be grateful if you would confirm receipt of my attached letter on behalf of the Royal Horticultural Society.

David Alexander MA MRICS
Principal Surveyor
davidalexander@rhs.org.uk
Mob: 07970 138338
Royal Horticultural Society
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Reg charity no. 222879/SC038262

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RHS Gardens Wisley
Wisley Lane
Woking
Surrey GU23 6QB

BY EMAIL

Ms Marian Spain
Interim Chief Executive
Natural England

1 April 2020

Dear Ms Spain,

Highways England's application for a M25 (Junction 10) Development Consent Order (DCO): RHS's concerns regarding Natural England's statutory consultee advice

You may be aware that the Royal Horticultural Society is formally objecting to Highways England's (**"HE's"**) above DCO application to alter junction 10 on the M25. This is because HE's proposed scheme will permanently and adversely affect road access to our garden at Wisley and result in severely reduced visitor numbers. This concerns us greatly.

I am writing to let you know that on Friday this week we will be both writing to the senior Natural England (**"NE"**) officer, Marc Turner, involved in this case and at the same time making representations to the DCO Examining Authority. Our correspondence and representations will explain that the statutory advice given by NE to HE to date on the "European site" impacts of the DCO application is incorrect and not aligned with the strict legal framework required under the Wild Birds and Habitats Directives. We have reached these conclusions after taking legal advice.

The unfortunate result of NE's statutory advice (and HE's consequent approach) to date is that no consideration is being given by NE or HE or the Examining Authority at the DCO Inquiry to an alternative layout of the junction proposed by RHS. This alternative scheme would reduce mileage to and from Wisley garden, improve accessibility to the garden (one of the HE scheme objectives), and reduce air pollution impacts on the Special Protection Area and the wider environment. If NE were giving advice consistent with the legal requirements of the Wild Birds and Habitats Directives, then this alternative would be being considered.

I regret that we have to make these representations but I wanted to ensure that you were aware of the position. Clearly, I would value very much any opportunity to engage with you over these issues and explain our position further if that were possible.

Yours faithfully

David Alexander MA MRICS
Principal Surveyor

Cc; Mr T Juniper - Chair, Natural England
Sue Biggs – RHS Director General
Dr Alistair Griffiths – RHS Director of Science and Collections

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RHS Gardens Wisley
Wisley Lane
Woking
Surrey GU23 6QB

Inspiring everyone to grow

Marc Tuner
English Nature

3rd April 2020
BY EMAIL

Dear Mr Turner

NATURAL ENGLAND'S INCORRECT STATUTORY ADVICE RELATING TO HIGHWAYS ENGLAND'S M25 JUNCTION 10/A3 WISLEY INTERCHANGE IMPROVEMENT SCHEME

You will be aware that the Royal Horticultural Society (**"RHS"**) is objecting to the application made by the Government-owned Strategic Highways Company (formerly Highways England) (**"HE"**) for a Development Consent Order under s37 of the Planning Act 2008 in relation to the M25 junction 10/A3 Wisley interchange improvement scheme (**"DCO Scheme"**).

In that context the RHS is very concerned about Natural England's statutory advice to the Secretary of State (who must determine this application) in relation to the assessment of impacts of the DCO Scheme on the Thames Basin Heaths Special Protection Area (**"SPA"**).

RHS has taken legal advice on this issue. This concludes that, if the Secretary of State follows the current statutory advice from NE (in relation to the assessment of impacts from the DCO Scheme on the SPA undertaken to date by HE), then any resulting Development Consent Order will be unlawful due to a failure to apply correctly the requirements of the European Habitats Directive (as it applies to the SPA) and the Conservation of Habitats and Species Regulations 2017. Full details are in the Annex attached.

Based on the evidence presented by HE to date, the *correct* conclusion, which NE ought to be advising, is that the Secretary of State is required to (I) consider the alternative road layout put forward by the RHS (the **"RHS Alternative Scheme"**) which reduces the number of kilometres driven (compared with the DCO Scheme) by 2.6 million per year; and (ii) only grant development consent for the DCO Scheme if it can be shown that the DCO Scheme is the solution which (amongst the alternatives including the RHS Alternative Scheme) best respects the integrity of the SPA. This is an essential analysis so far ignored by both NE and HE.

The RHS has requested NE to engage with the RHS in relation to its concerns. However NE has refused to do on the grounds that NE has a 'very heavy work load' (this is stated in an application document REP5-003 p148).

I do appreciate that NE is under work load pressure. It is however critical that this matter is properly addressed. I have written to your Chief Executive giving notice of our position and we are keen to engage with you, so look forward to your considered response and contact.

Yours sincerely

David Alexander
Principal Surveyor

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FREETHS

ANNEX

NATURAL ENGLAND'S INCORRECT STATUTORY ADVICE ON HIGHWAY ENGLAND'S STATEMENT TO INFORM A HABITATS REGULATIONS ASSESSMENT OF THE DCO SCHEME

SUMMARY

1. The Government-owned Strategic Highways Company (formerly Highways England) (**"HE"**) has made an application for a Development Consent Order under s37 of the Planning Act 2008 in relation to the M25 junction 10/A3 Wisley interchange improvement scheme (the **"DCO Scheme"**).

2. HE, with Natural England's (**"NE's"**) support, has concluded in its "Statement to Inform an Appropriate Assessment" (**"SIAA"**) of the DCO Scheme dated 3 March 2020 (APP-043), that there will be no adverse effect on the integrity of the Thames Basin Heaths Special Protection Area as a result of changes in air quality linked to traffic from the DCO Scheme. This has been confirmed in a further HE document (REP5-024 dated 3 March 2020) and in the HE / NE Statement of Common Ground dated 3 March 2020 (**"SoCG"**) (REP5-003).

3. This conclusion has been reached on the basis that, although HE and NE acknowledge that there will be "significant increases" in air pollutants on *woodland* within the SPA from the DCO Scheme, the levels of air pollutants at the location of the *heathland* within the SPA (located 150m from the A3 road at its nearest point) will be negligible and hence the pollutant increases are not a cause for concern and allow a conclusion of "no adverse effect on SPA site integrity" from the air quality impact pathway.

4. Based on the information presented by HE, this conclusion is incorrect and does not accord with the strict legal protection afforded to European sites as set out in legislation and caselaw. This is fully explained in the detail below.

5. NE and HE have acknowledged that the DCO Scheme *will* give rise to an adverse effect on integrity of the SPA through woodland "land take" from the SPA (3.2.12 of SoCG). On that basis NE and HE has acknowledged that the Secretary of State must consider how the Habitats Directive "derogation tests" are met, which includes a requirement to examine any "alternative solutions" ie any alternative solution which would better respect the integrity of the SPA than the DCO Scheme.

6. Since, however, NE and HE have (wrongly) concluded that there will be no adverse impact on the SPA via an air quality impact pathway, HE has not provided to the Secretary of State any analysis of whether any alternative solution might better respect the integrity of the SPA in terms of air pollutant impacts. Similarly, NE has (wrongly) failed to request such information.

7. Based on HE's *own* evidence to date, the correct conclusion is that an adverse impact on the SPA from air emissions from DCO Scheme cannot be ruled out. As such the Secretary of State's consideration of alternative solutions must include consideration of any alternative solution that would better respect the integrity of the SPA in terms of air quality impact.

8. RHS has proposed an alternative layout (the "**RHS Alternative Scheme**") incorporating additional components to the DCO Scheme which would significantly reduce the emissions to air from traffic since it would lead to a reduction of 2.6 million kilometres per annum (via the DCO signposted route) compared with the DCO Scheme. Based on HE's present evidence, this alternative must therefore be considered and a judgment made by the Secretary of State

(and so it follows by HE so as to inform the Secretary of State) as to whether the RHS Alternative is an alternative solution that better respects the integrity of the SPA.

DETAIL

Key European Court caselaw and guidance

9. The Court of Justice of the European Union (**"CJEU"**) caselaw makes clear that consideration of "alternative solutions" under Article 6(4) of the Habitats Directive (implemented by regulation 64(1) of the Conservation of Habitats and Species Regulations 2017) must be informed by a robust assessment under Article 6(3) of the Habitats Directive.

10. In its ruling in case C-304/05 *Commission of the European Communities v Italian Republic*, paragraph 83, the Court stated that:

Article 6(4) of Directive 92/43 can apply only after the implications of a plan or project have been studied in accordance with Article 6(3) of that directive. Knowledge of those implications in the light of the conservation objectives relating to the site in question is a necessary prerequisite for application of Article 6(4) since, in the absence thereof, no condition for application of that derogating provision can be assessed. The assessment of any imperative reasons of overriding public interest and that of the existence of less harmful alternatives require a weighing up against the damage caused to the site by the plan or project under consideration. In addition, in order to determine the nature of any compensatory measures, the damage to the site must be precisely identified' (see also C-399/14, C-387&388/15, C-142/16).

11. The CJEU has been clear as to the robust manner in which an appropriate assessment under Article 6(3) must be conducted:

11.1. An appropriate assessment must precede the DCO Scheme's approval and take into account the cumulative effects which result from the combination of that plan or project with other plans or projects *in view of the site's conservation objectives*[1].

11.2. An appropriate assessment must ensure that *all aspects* of the DCO Scheme which can, either individually or in combination with other plans or projects, affect the conservation objectives of any European site *are identified in the light of the best scientific knowledge in the field*[2].

11.3. An appropriate assessment *may not have lacunae and must contain complete, precise, and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the proposals on the protected site(s) concerned*[3].

[1] Paragraph 53 of the judgment in *Landelijke Vereniging tot Behoud van de Waddenzee v Staatssecretaris van Landbouw, Natuurbeheer en Visserij* (C-127/02) http://curia.europa.eu/juris/showPdf.jsf;jsessionid=9A8BC9FFD4CD3D767F9B47A756DD06FA?text=&docid=49452&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=2229622

[2] Paragraph 54 of the judgement in *Landelijke Vereniging tot Behoud van de Waddenzee v Staatssecretaris van Landbouw, Natuurbeheer en Visserij* (C-127/02)- http://curia.europa.eu/juris/showPdf.jsf?text=&docid=49452&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=646546

[3] Paragraph 44 of the judgement in *Sweetman v An Bord Pleanala* (C-258/11) - http://curia.europa.eu/juris/document/document.jsf?text=&docid=136145&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=645773

12. The CJEU has also been clear as to the strictness of the "no adverse effect on site integrity" test:

12.1. As to the meaning of the "integrity" of the site, the Court stated in its ruling in case C-258/11, paragraph 48:

Article 6(3) of the Habitats Directive must be interpreted as meaning that a plan or project not directly connected with or necessary to the management of a site will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of SCIs, in accordance with the directive. The precautionary principle should be applied for the purposes of that appraisal.

12.2. The European Commission Guidance on Managing Natura 2000 dated 21 November 2018[4] states with reference to the paragraph above (on page 50) "*The logic of such an interpretation would also be relevant to ….habitats of species*".

12.3. Managing Natura 2000 also states (page 50):

As regards the connotation or meaning of 'integrity', this clearly relates to ecological integrity. This can be considered as a quality or condition of being whole or complete. In a dynamic ecological context, it can also be considered as having the sense of resilience and ability to evolve in ways that are favourable to conservation.

And

The 'integrity of the site' can be usefully defined as the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated.

12.4. As regards a conclusion of "no adverse effect on integrity on a European site":

12.4.1. this test is only reached where the competent authority is *certain* (through the HRA assessment process) that there will be no resulting adverse effect on the integrity of any European site(s) either alone or in combination with any other plan or project[5]; and

12.4.2. certainty arises where the competent authority (through the HRA process) *has no reasonable scientific doubt as to the absence of such effects*[6].

Application of the CJEU caselaw and guidance to NE's and HE's assessment of air quality impacts on the "Ockham and Wisley Common" component of the Thames Basin Heaths SPA

[4] The European Commission Guidance on Managing Natura 2000 dated 21 November 2018- https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/Provisions_Art_6_nov_2018_en.pdf

[5] Paragraph 40 of the judgement in *Sweetman v An Bord Pleanala* (C-258/11) - http://curia.europa.eu/juris/document/document.jsf?text=&docid=136145&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=645773

[6] Paragraph 40 of the judgement in *Sweetman v An Bord Pleanala* (C-258/11) - http://curia.europa.eu/juris/document/document.jsf?text=&docid=136145&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=645773

13. NE and HE acknowledge that there *will* be "*significant increases*" in nitrogen deposition rates within the "Ockham and Wisley Common" component of the Thames Basin Heaths SPA (3.2.13 SoCG, see also paragraph 16 below).

14. However, NE and HE say that these significant increases are confined to the part of the SPA they describe as the woodland buffer aligning the A3 and M25 (3.3.1 SoCG makes clear that this is the area 150m or less from the road) and that these increases are negligible where the *heathland* within the SPA occurs (SoCG 3.2.13). Paragraph 3.2.6 SoCG also states "*the SIAA determined that the spatial extent of the air pollution impact is confined to the established woodland that separates the heathland from the roads*".

15. On this basis NE and HE wrongly conclude that there is no reasonable scientific doubt as to the absence of adverse effects to the integrity of the SPA (from the DCO Scheme alone or in combination with other plans and projects) from changes in air quality (SoCG 3.2.13).

16. For completeness SoCG 3.2.13 states:

    Taking into account the updated calculations [ie those in Appendix B to the SoCG]*, the changes in nitrogen deposition rates are negligible at the distance that the heathland occurs, and therefore all significant increases are confined within the woodland buffer that aligns the A3 and M25.*

    Therefore, even when taking into account updated velocities and RHS Wisley traffic following the signed route along the A3, it is clear that no reasonable scientific doubt remains as to the absence of adverse effects to the integrity of the SPA in the SIAA, and that Highways England are certain that the changes in air quality as a result of the Scheme (alone or in combination with other plans and projects) will lead to no adverse effects on the Thames Basin Heaths SPA as a result of changes in air quality.

    Therefore, adverse effects to the integrity of the SPA from changes in air quality can be ruled out and there is no requirement to consider alternatives in respect of air quality.

    Refer to Appendix B for a technical note on the SIAA findings after the updated calculations.

17. The same explanation is given in HE's document REP5-024 (dated 3 March 2020) which, after providing new data in a Table 8, states:

    1.1.4 As explained in paragraph 7.2.51 of the SIAA [APP-043] and again in Point 11 of REP4-005 (pages 10-16), the established woodland that separates the A3 and M25 from the heathland habitats of the SPA acts as a buffer and does not support the qualifying SPA species. For each of the transects within the SPA, the heathland habitats occur at a distance of 150 m or greater, and therefore, any points closer than 150 m fall within the woodland buffer. For completeness, nitrogen deposition rates have been added to this version of the table for transect distances of 150 m and 200 m in the table below, in order to enable a full understanding of the changes in nitrogen deposition at the distances at which the heathland occurs.

    1.1.5 It can clearly be seen in the table that the revised nitrogen deposition rates at the distance at which the habitat that supports the qualifying SPA species occurs (150 m at the closest point), fall well below 1% of the lower range of the critical load for heathland. Therefore, even after taking into account the revised nitrogen deposition rates, the Scheme will still not lead to an adverse effect on the SPA as a result of air quality impacts."

18. Clearly, from the above, HE's / NE's conclusion that the DCO Scheme will lead to "no adverse effect on SPA site integrity from an air quality pathway" is based on an assumption – namely that the woodland (within the Ockham and Wisley Common component of the SPA), which they acknowledge will be subject to "significant increases" in nitrogen deposition from the DCO Scheme (SoCG 3.2.13), has no relevance to the integrity of the SPA.

19. However, this conclusion is directly contradicted by HE's *own assessment* of woodland land-take impacts of the DCO Scheme which is supported by NE; and also by NE's / HE's *own statements* in the SoCG relating to air quality impacts. This conclusion is therefore simply wrong.

20. HE's SIAA (APP-043) clearly acknowledges that there *is* a pathway of impact between woodland in the SPA and the integrity of the SPA, based on the potential for the woodland to provide invertebrate prey items for the SPA's qualifying features, particularly nightjar. HE's SIAA states, when considering the loss of woodland caused by land-take of the DCO Scheme:

> *7.2.10 Whilst the mixed woodland to be lost as a result of the Scheme does not directly support the qualifying species as a nesting or foraging habitat, it does form a supporting habitat of the SPA and does contribute to the overall invertebrate resource within the wider SPA.*
>
> *7.2.17. The permanent loss of 5.9 ha of mixed woodland habitat, and temporary loss of 8.6 ha of mixed woodland habitat from the SPA equates to 10.1% of the total woodland within the Ockham and Wisley Commons SSSI component of the SPA (143 ha).*
>
> *7.2.20 The loss of invertebrate resources could have an impact on the following targets identified in the Natural England Supplementary Advice on Conserving and Restoring Features, and thus interrupt progress towards achieving the conservation objectives of the SPA, particularly with regards to nightjar.*
>
> *1. Food availability: Maintain or restore the distribution, abundance and availability of key prey items at prey sizes preferred by all three of the qualifying features;*
>
> *2. Extent and distribution of supporting habitat for the breeding season: Maintain the extent, distribution and availability of suitable breeding habitat which supports each of the three qualifying features for all necessary stages of their breeding cycle (courtship, nesting, feeding and roosting).*
>
> *7.2.23 When considering the appropriate assessment test, although the evidence provided clearly demonstrates that the qualifying species* [these are Woodlark, Dartford warbler and Nightjar] *are mainly reliant on the heathland habitats for their invertebrate resource, the loss of 10.1% of the total woodland within the Ockham and Wisley Commons SSSI component of the SPA will contribute to some reduction in the invertebrate food resource within the wider SPA and thus could have an indirect negative impact on the qualifying species (particularly nightjar).*
>
> *7.2.24. The loss of this land will represent a permanent and irreversible adverse effect on the integrity of the Thames Basin Heaths SPA, with respect to the conservation objectives to 'maintain the extent and distribution of the habitats of the qualifying features' and 'maintain or restore the distribution, abundance and availability of key prey items'. However, this loss of land would not cause any reductions in the abundance and/ or distribution of populations of any of the three qualifying species,*

as the heathland habitats within which they occur will remain untouched by the Scheme.

21. In support of this conclusion the SIAA also states that:

    21.1. As regards woodlark:

    4.7.15 ….. the adjacent woodland areas within the SPA may contribute to the invertebrate resource of woodlarks, by increasing the abundance of invertebrates such as moths and associated caterpillars within the heathland areas.

    21.2. As regards nightjar:

    4.7.12 ….. the adjacent woodland areas within the SPA may contribute to the invertebrate resource of nightjars, by increasing the abundance of moths and beetles within the heathland areas, especially at the woodland edges.

22. HE's comments at Point 11 of the Table at Section 2 (pages 8-20) of REP4-005 (Comments on RHS's overview letter) says the same:

    …..it has already been accepted by Highways England that it is not possible to conclude no adverse effect to site integrity. The adverse effect to site integrity follows a precautionary approach and is based on land take from the SPA and the potential for the woodland being lost to provide an invertebrate resource, even though it does not physically support the qualifying species.

23. Furthermore, even in the context of air quality impacts (instead of land-take impacts), the NE / HE SoCG (paragraph 3.2.6) acknowledges the same pathway / link between the woodland buffer and the invertebrate source for the wider SPA:

    3.2.6 …….Whilst this woodland buffer may also provide an invertebrate source for the wider SPA, it does not itself support any of the qualifying species as a foraging or nesting habitat…..

24. Further references to this pathway/ link are found in the correspondence between NE and HE and their advisors at Appendix A to the SoCG (eg pages 48, 51 and 68).

25. We see this acknowledged again in the context of HE's proposals for the provision of compensatory habitat under Article 6(4) Habitats Directive (as applied to the SPA). HE and NE in this context state (3.2.17 of the SoCG) that "*the primary purpose of the compensation land is to provide invertebrate resource for the SPA qualifying features, as opposed to providing foraging or nesting habitat*". Hence again here HE and NE are demonstrating that they believe that there is an important role for land in terms of the qualifying SPA species even where they believe that that land is not used by foraging or nesting birds of the SPA's qualifying species (a point with which RHS's ecologist takes issue, see paragraphs 41-45 below).

26. It could not be clearer from the above that both NE and HE acknowledge that a reduction in invertebrates from the woodland within this component of the SPA "*could have an indirect negative impact on the qualifying species (particularly nightjar)*" (see in particular 7.2.23 from the SIAA above)[7].

[7] This is an appropriate conclusion to draw, particularly in light of the European case of *Brian Holohan and Others v An Bord Pleanala* (C-461/17 of 7 November 2018)[7]. At paragraph 40 of this judgment the CJEU rules:

27. Indeed it is *because* of the accepted link between invertebrates in the SPA's woodland and the qualifying features of the SPA that NE / HE have concluded that the SPA woodland land-take resulting from the DCO Scheme *will* adversely affect the integrity of the SPA (see for example SoCG 3.2.12 and SIAA 7.2.24 and paragraph 22 above).

28. On that basis, it cannot logically be concluded by NE or HE that, because they believe that the woodland does not support foraging or nesting habitat for the qualifying bird species (as to which see paragraphs 41-45 below), the acknowledged significant air quality deterioration from the DCO Scheme in the woodland of the SPA within 150m from the road has no relevance to the integrity of the SPA.

29. This fails to take account of the very impact pathway (ie reduction in invertebrates in the woodland) which has lead NE and HE to conclude that there will be an adverse effect from the land-take associated with the DCO Scheme. It also fails to meet the robust standards required for appropriate assessment under the caselaw set out at paragraph 12 above.

30. It is also directly contradicted by HE's SIAA which states at 7.2.33:

    significant increases in nitrogen deposition resulting from the Scheme …could lead to a reduction in ….their [ie the SPA qualifying species'] *invertebrate resource*

    As already noted above, both NE and HE have acknowledged at SoCG at 3.2.13 that there *are* to be significant increases in nitrogen deposition from the DCO Scheme in the woodland <150m from the road.

31. HE states in point 11 of the Table at Section 2 of REP4-005 (pages 8-20) (HE comments on RHS's overview letter) (and this is repeated at 3.2.6 SoCG) that:

    Whilst this woodland buffer may also provide an invertebrate source for the wider SPA, it does not itself support any of the qualifying species as a foraging or nesting habitat. It is important to recognise that, in the case of a classified SPA, the ecological interest is the bird species which occur within the site. The classification of the site as an SPA recognises the importance of the habitats within the site, but only so far as they support the populations of SPA species for which the site has been classified. The habitats are not protected in their own right as would be the case for a designated SAC.

32. The above statement is however irrelevant. This is because NE and HE have already acknowledged the role played by the invertebrates in the woodland to the integrity of the SPA in view of the SPA's conservation objectives. NE and HE have concluded that loss of invertebrates from the woodland will lead to an adverse effect on integrity. Since that is the case it is irrelevant that "the habitats" of a SPA "are not protected in their own right".

33. The conclusion reached by NE and HE (summarised at paragraph 28 above) could only be sustained if NE and HE were *certain, based on the best scientific knowledge in the field,* that invertebrates in the woodland would in no way be affected by the acknowledged significant air quality deterioration in the woodland and where this were based on *correct and robust air*

"*In the light of the foregoing, the answer to the first three questions is that Article 6(3) of the Habitats Directive must be interpreted as meaning that an 'appropriate assessment' must, on the one hand, catalogue the entirety of habitat types and species for which a site is protected,* ***and, on the other, identify and examine both the implications of the proposed project for the species present on that site, and for which that site has not been listed****, and the implications for habitat types and species to be found outside the boundaries of that site,* ***provided that those implications are liable to affect the conservation objectives of the site."***

quality data (as to the air quality date, see "Further comments on the HE air quality evidence" below). No or insufficient evidence on this has as yet been presented by HE or requested by NE.

34. However, Baker Consultants Ltd, ecologists on behalf of RHS, have researched the scientific literature. This demonstrates a clear link between nitrogen deposition and potential adverse impacts upon invertebrate populations. Andrew Baker's summary is contained at the Appendix to this Annex.

35. Based on the assessment considered by NE and HE to date, therefore, the only possible logical conclusion is that an adverse effect on integrity of the SPA through air quality impacts of the DCO Scheme (either alone or in combination with other plans or projects) cannot be ruled out. Thus, the adverse effect on SPA integrity test is failed in relation to air quality impacts.

36. This is particularly the case given that (as explained in the caselaw see paragraph 12 above) in order to rule out any adverse effect on site integrity from the air quality pathway, the Secretary of State must be *certain* (through the HRA assessment process) that there will be no resulting adverse effect on the integrity of any European site(s) either alone or in combination with any other plan or project. This means that the Secretary of State must have *no reasonable scientific doubt as to the absence of such effects*.

37. The RHS is well aware of the recent High Court case of *Compton Parish Council v Guildford Borough Council* [2019] EWHC 3242 (Admin) (**"Guildford case"**). This does not alter the position set out above.

38. The key differences between the Guildford case and the DCO Scheme, as made clear by the judgment, are that:

    38.1. In the present case HE and NE have simply taken the view that all land within the SPA between 0m and 150m from the road can be disregarded for air quality impact assessment purposes since only air quality impacts on heathland are relevant and the nearest heathland is at 150m from the road. This approach finds no support whatsoever in the Guildford case. The approach adopted in the Guildford case was instead (as one would expect) to consider at what distance from the roads the air pollutant increases would be significant and then consider how those significant increases might affect the qualifying features of the SPA.

    38.2. In the Guildford case there was no acknowledgement in the appropriate assessment that loss of invertebrates in the woodland within the SPA between the road and the heathland *will* amount to an adverse effect on SPA site integrity. A crucial difference in this case is that NE and HE *have* acknowledged this impact pathway, by concluding that there *will be* an adverse effect on integrity on the SPA from the woodland land-take necessitated by the DCO Scheme (SoCG, 3.2.12 and SIAA 7.2.24). Having presented this impact pathway, NE / HE cannot logically then conclude that acknowledged "significant increases" in air pollutants from the DCO Scheme within the SPA's woodland (this being NE / HE's own words, 3.2.13 SoCG) have no relevance to the integrity of the SPA and can be dismissed as an impact pathway. This is particularly when the HE's SIAA states (7.2.33) (see above) that "*significant increases in nitrogen deposition resulting from the Scheme …could lead to a reduction in ….their* [ie the SPA qualifying species'] *invertebrate resource".*

39. As explained above, based on present information provided by HE, the "adverse effect on SPA integrity test" is failed in this case in relation to air quality impacts.

40. As such the statement in 3.2.13 SoCG that "*there is no requirement to consider alternatives in respect of air quality*" is incorrect. Instead the Secretary of State must satisfy himself that there is no alternative solution to the DCO Scheme which better respects the integrity of the SPA in terms of the air quality impact pathway. The alternative solutions section of the HRA as contained in APP-044 must be updated by HE and NE must request that additional information.

41. Although NE and HE appear to be of the view that birds of the SPA qualifying species do not nest or forage in, and are not present in, the woodland up to 150m from the road, RHS's ecologist, Andrew Baker, has noted that this has not been demonstrated by the data. HE has not in fact comprehensively surveyed these areas for breeding activity and has carried out no surveys of foraging activity.

42. The nightjar and woodlark surveys carried out by HE to inform the SIAA (and the ES) employed the method set out in Gilbert et al 1998 (ES Appendix 7.15 Breeding Bird Surveys para 7.1.3.3). The transects walked during these surveys are shown in 7.21, 7.22 and 7.23 (Chapter 7 Biodiversity Figures 3 of 3[8]). Woodland areas of the SPA within 150m of the roads were only surveyed in 2016 when the nightjar and woodlark surveys appear to have been combined with the general breeding bird surveys (Figure 7.21). During the surveys of 2017 and 2018 the nightjar and woodlark surveys did *not* cover areas within the woodland (Figure 7.22 and 7.23).

43. Consequently, with only 1 year of *woodland* nightjar and woodlark surveys, NE and HE cannot be remotely certain of the level of nightjar or woodlark activity in the woodland areas of the SPA.

44. Furthermore, the method set out in Gilbert et al 1998 can only be used to establish the location of *breeding territories* of Nightjar and woodlark. Since Nightjar often forage some distance away from their nesting territories, no assumption can be made (on the basis of the Gilbert et al technique) as regards this species' foraging locations. Therefore HE in fact has no data whatsoever on the foraging behaviour of Nightjar and therefore cannot conclude, as is claimed, that the woodland does not support foraging Nightjar foraging birds.

45. It should also be noted that the survey method employed by HE had been shown, several years before the HE surveys began, to be unreliable at detecting presence/absence of the birds. Peer reviewed research carried out by Baker Consultants Ltd along with the University of Newcastle[9] clearly demonstrated that, compared with conventional survey methods, bioacoustics surveys were three times more effective than human surveyors. The research found that human surveyors only detected nightjar on 6 out of 22 surveys whereas bioacoustic recorders detected activity in 19 out of 22 survey periods. The HE surveys therefore did not employ the best available techniques to gather the survey data.

Further comments on the HE air quality evidence

46. When considering impacts of traffic related air pollutants on the SPA (via the woodland invertebrate pathway as is required above), the Secretary of State must take into account appropriately robust modelled levels of air pollutants.

47. The following comments demonstrate that, to date, robust data has not been considered by NE or HE.

[8] These figures are incorrectly referenced in Appendix 7.15 at paragraph 7.1.3.6.

[9] Zwart MC, Baker A, McGowan PJ, Whittingham MJ 2014 The use of automated bioacoustic recorders to replace human wildlife surveys: an example using nightjars PLoS One.

Ammonia

48. RHS has made clear to the inquiry that ammonia levels and impacts from the predicted traffic (from the DCO Scheme alone and in combination with other plans or projects) have not been taken into account in HE's assessment. RHS's evidence is presented in REP1-041 para 3.12 and Appendix A4; REP3-044 page 13; REP3-050 section 2.7 page 5; REP5-49; REP 5-054, Question 2.3.2 page 1; REP5-054 section 2.4.8 page 2.

49. RHS remains of the view that ammonia impacts must be taken into account as, without this, the appropriate assessment cannot be robust ie it will not be based on best scientific knowledge in the field and will be incomplete.

50. In response to this, NE and HE state in 3.3.1 of the SoCG that:

The air quality assessment has been carried out in accordance with the Department for Transport's National Policy Statement for National Networks which requires consistency with Defra's published future national projections based on future emissions, traffic, and vehicle fleet, known as the Emissions Factors Toolkit (EFT). Ammonia is not included within this EFT, and hence there is no requirement for assessment.

Highways England initially adopted a precautionary approach to double the changes in nitrogen deposition rates with the Scheme to demonstrate that there would be no material change in nitrogen deposition rates at the location of the heathland in the SPA (at 150 metres from the road). This approach was also considered to be precautionary by Natural England.

Upon further analysis of the measured ammonia data provided by RHS Wisley within REP1-041 at Appendix A4, it could be seen that the concentrations decreased rapidly away from the road, such that concentrations could be considered to be at background levels by 30 metres from the road centre.

Hence any changes from road traffic would not affect the nitrogen deposition rates at the distance at the location of the heathland in the SPA.

51. The first key point is that it is irrelevant that "*ammonia is not included within this EFT".* Based on the CJEU caselaw, the absence of a requirement for assessing ammonia in the EFT is no proper basis for its exclusion from analysis. As the CJEU caselaw at paragraphs 12.2 and 12.3 of this Annex state, the SIAA must ensure that *all aspects* of the DCO Scheme which can, either individually or in combination with other plans or projects, affect the conservation objectives of any European site *are identified in the light of the best scientific knowledge in the field*. Furthermore an appropriate assessment *may not have lacunae and must contain complete, precise, and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the proposals on the protected site(s) concerned.* The CJEU caselaw does not say "if a guidance note does not require it, it can be ignored".

52. In any event it is already commonplace for consideration of ammonia emissions from traffic to be included in appropriate assessments. Three different air quality consultancy companies (Air Quality Consultants, AECOM and Ricardo Energy & Environment) have recently addressed this very issue in recent Local Plan HRAs for Wealden District Council, Epping Forest District Council and Havant Borough Council. Hence consideration of ammonia is plainly accepted as required for appropriate assessments within the air quality consultancy industry, and presumably also by NE who was the statutory consultee for those local plans, notwithstanding the fact that relevant guidance does not include a requirement for this. The CJEU caselaw requirements of appropriate assessment above cannot be met without inclusion of an assessment of traffic-based ammonia.

53. The second point is that it is incorrect for the SoCG to state that: "*Upon further analysis of the measured ammonia data provided by RHS Wisley within REP1-041 at Appendix A4, it could be seen that the concentrations decreased rapidly away from the road, such that concentrations could be considered to be at background levels by 30 metres from the road centre*[10]. It is not correct that concentrations of ammonia are 'at background levels' at 30m from the road and hence by implication their contribution to nitrogen deposition beyond that distance can be ignored. HE has reached this conclusion by reference to Figure 1 in Appendix 4 to REP1-041. Had HE considered Figure 2 (just beneath Figure 1), which also includes NOx concentrations, it is clear that both pollutants follow a broadly exponential decline with distance. This decline will go beyond the 100m shown – essentially out to an infinite distance - as is well recognised by all air quality experts. It is thus the case that both ammonia and NOx will be making contributions to nitrogen deposition at all distances and there is not a cut-off at 30m from the road. It is necessary to include the contribution of ammonia to nitrogen deposition at all distances.

54. The third point is that it is essential for the appropriate assessment to consider HE's deposition data taking into account ammonia, in line with the NE / HE-acknowledged "precautionary approach" (see paragraph 50 above). The following addresses this point:

    54.1. HE has provided a response in Appendix B to the SoCG with NE that deals, amongst other matters, with in-combination impacts of nitrogen deposition from the DCO Scheme (REP5-003). It sets out, for the first time, the in-combination impacts of nitrogen deposition associated with the DCO Scheme calculated in accordance with the correct methodology described by RHS in REP4-005 at point 2.9.1 on page 56. The results of these in-combination calculations are set out in Table 4, page 163, in Appendix B to REP5-003.

    54.2. The first point to make is that Table 4 is clearly deficient in that it does not set out the in-combination impacts of nitrogen deposition for the all of the receptors, just those 150 m and 200 m from the road (it is believed that the distances in column B should be labelled 'Distance from edge of the road'). Hence, HE has still not provided correct in-combination figures for nitrogen deposition for the land of the SPA between 0 and 150 m.

    54.3. Furthermore, Table 4 does not take into account ammonia. RHS' air quality consultants have therefore reproduced in Table 1 below the results from HE's Table 4 (in columns A to J (the transect numbers have also been added to the first column)). RHS' air quality consultants have then added columns K to N to provide additional information, in particular an assessment of the likely increases in Nitrogen deposition if ammonia is taken into account based on HE / NE's assumption that ammonia would double the nitrogen deposition due to NOx emissions (this is the "precautionary" approach described by NE / HE at 3.3.1 of the SoCG).

    54.4. Column K of Table 1 is the same as column G, but with a header that makes clear that this is the in-combination impact (the DCO Scheme together with other plans and

[10] We see this conclusion also in REP5-014 paragraph 2.3.3 "*Figure 1 in REP1-041 shows that concentrations of ammonia in the Ashdown Forest SAC decrease rapidly from the edge of the road, such that by 30 metres they are at background levels*". And in REP4-005 2.7.1 p52 "*In any case, the monitoring data for ammonia in the Ashdown Forest SAC to which RHS refer shows that in Figure 1 of REP1-041 concentrations of ammonia decrease rapidly from the edge of the kerb such that by 30 metres they are at background levels*".

projects) in terms of Nitrogen deposition (units for Nitrogen deposition are all kgN/ha/yr).

54.5. Column L is column K expressed as a percentage of the critical load (which is 10 kgN/ha/yr for both the heathland and the woodland – see REP4-005 RHS Response on page 37, para beginning "APIS presents critical loads …").

54.6. Column M is included to show the impact of including ammonia into the nitrogen deposition calculations, based on HE / NE's assumption that it would double the nitrogen deposition due to NOx emissions (this is the "precautionary" approach described by NE / HE at 3.3.1 of the SoCG). In practice, RHS' REP5-049 makes clear that this doubling is likely to be an underestimate, and the contribution is likely to be more than double, and hence it should not be considered precautionary.

54.7. It can be seen from Table 1 below that, even at a 150m distance from the road, the increases in nitrogen deposition arising from the DCO Scheme in combination with other plans or projects (when doubled to account for ammonia in the manner suggested by HE / NE) are significant, reaching up to 6% of the critical load in one case. These figures only reflect the area of the SPA beyond 150m from the road. Obviously if Table 1 were to show (as it needs to) figures for the area of the SPA between 0m and 150m from the road then much bigger increases in nitrogen deposition. This additional information is required urgently from HE in order for complete assessment to be carried out in accordance with the legal requirements.

55. Table 1:

	Receptor ID	Distance from road centre (m)	2015 Base N Dep	2022 Future base 'do nothing' (DN) N Dep	2022 'do minimum' (DM) N Dep	2022 'do something' (DS) N Dep	2022 Change DS-DN (a)	2022 Change DM-DN (b)	Scheme Alone Difference (a) - (b)	In-Combination Difference	In-combination Impact (% of CL)	In-combination Impact with Ammonia (% of CL)
	A	B	C	D	E	F	G	H	J	K	L	M
Transect 5: West of A3	R132	150	16.32	13.69	13.88	13.85	0.16	0.19	-0.03	0.16	**1.6%**	**3.2%**
(north of Wisley Lane)	R133	200	16.01	13.45	13.59	13.56	0.11	0.14	-0.03	0.11	**1.1%**	**2.2%**
Transect 6: East of A3	R139	150	16.8	14.06	14.35	14.29	0.23	0.29	-0.06	0.23	**2.3%**	**4.6%**
(near Bolder Mere)	R140	200	16.33	13.69	13.91	13.85	0.16	0.22	-0.06	0.16	**1.6%**	**3.2%**
Transect 3: West of A3	R147	150	17.34	14.47	14.64	14.64	0.17	0.17	<0.01	0.17	**1.7%**	**3.4%**
(close to junction 10)	R148	200	17.05	14.24	14.4	14.4	0.16	0.16	<0.01	0.16	**1.6%**	**3.2%**
Transect 4: East of A3	R155	150	17.77	14.8	14.84	14.81	0.01	0.04	-0.03	0.01	0.1%	0.2%
(close to junction 10)	R156	200	17.23	14.38	14.46	14.46	0.08	0.08	<0.01	0.08	0.8%	**1.6%**
Transect 1: South of M25	R163	150	17.51	14.6	14.9	14.9	0.3	0.3	<0.01	0.3	**3.0%**	**6.0%**
(west of junction 10)	R164	200	17.05	14.24	14.49	14.49	0.25	0.25	<0.01	0.25	**2.5%**	**5.0%**
Transect 2: South of M25	R193	150	17.69	14.73	14.93	14.9	0.17	0.2	-0.03	0.17	**1.7%**	**3.4%**
(east of junction 10)	R194	200	17.27	14.41	14.58	14.55	0.14	0.17	-0.03	0.14	**1.4%**	**2.8%**

56. <u>Future predictions of nitrogen deposition falling below the current baseline</u>

57. Paragraph 3.2.8 of the SoCG states that:

For every point of all the transects within the SPA including both the open heathland and the established woodland buffer the predicted operational nitrogen deposition levels (even when taking into account updated velocities, RHS Wisley traffic along the A3 and ammonia) fall below the current baseline. This is due to predicted reductions in future emissions

58. The same point is made in Appendix B of SoCG on page 164:

In addition, it can be seen in Table 3 that nitrogen deposition rates for all points of each transect within the SPA (as a result of the scheme, in combination with other plans and projects) fall below the existing baseline, ensuring that the woodland buffer will continue to exist in its current state and will continue to provide the same buffer function as it currently does.

59. However these comments do not address the key point, which is the extent to which the DCO Scheme, either alone or in-combination, will slow down, and possibly prevent the conservation objective target for this component of the SPA to meet / fall under the relevant critical load for nitrogen deposition.

60. The following explains this in more detail.

61. Table 3 in Appendix B in REP5-003 sets out the nitrogen deposition rates for all the receptors on the six transects (ie including those at 0m-150m from the road) for 2015, and for one scenario in 2022, incorporating traffic associated with the DCO Scheme together with that from other plans and projects.

62. Table 3 shows that the nitrogen deposition rates will be lower in 2022 than in 2015, which is due to a declining regional background contribution of nitrogen deposition and to a declining NOx contribution from the local roads. Note, however, that the absolute nitrogen deposition rates would be higher if ammonia had been taken into account (as they should be).

63. Table 3 does not however include the do nothing and do-minimum nitrogen deposition rates. Hence it cannot be seen in Table 3 by how much the DCO Scheme, either alone or in-combination, will slow down this downward trend (ie slow down this improvement).

64. It is nevertheless clearly the case from the results in Table 3 that the nitrogen deposition rates in 2022 will remain well *above* the critical load of 10 kgN/ha/yr for heathland and woodland at all receptors, with no analysis provided of when the levels may meet or fall below the critical load, which is unlikely to be in the foreseeable future.

65. Furthermore it is also clear that the DCO Scheme both alone (see REP5-024) and in-combination (see Table 4 in Appendix B in REP5-003) will increase Nitrogen deposition at some receptors alone and all receptors in-combination, although, as already noted in the paragraph above, this is not shown in Table 3.

66. These increases from the DCO Scheme, both alone and in-combination, will represent a "slowing down" of the downward trend. The DCO Scheme, alone and in combination with other plans or projects, will therefore make it harder to achieve the conservation objective target in the SPA's Supplementary Advice to (for nightjar) "*Restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk)*" (there are similar targets for the other two qualifying species). The slowing down would be worse if ammonia were also taken into account.

67. Attainment of this target is already challenging, given the current considerable exceedances of the critical load – for example, at receptor R149 (5 m from the road) the nitrogen deposition is 24.38 kgN/ha/yr in 2022, which is 2.4 times the critical load (and this would be much higher had ammonia been included).

68. Furthermore it is clear from the Guildford case that it is not acceptable, when considering whether there might be an adverse effect on SPA site integrity from a plan or project, merely to rely on reductions in baseline emissions or the fact that with the development, emissions would still be much lower than at present. At paragraph 207 of the judgment, Sir Duncan Ouseley states:

    That [ie the question of whether there would be no adverse effect] *could not be answered, one way or the other, by simply considering whether there were exceedances of critical loads or*

levels, albeit rather lower than currently. What was required was an assessment of the significance of the exceedances for the SPA birds and their habitats. Guildford BC did not just treat reductions in the baseline emissions or the fact that with Plan development, emissions would still be much lower than at present, as showing that there would be no adverse effect from the Plan development…..

69. In this case, there has to date been:

69.1. no assessment by NE / HE of the air quality impacts on the NE- and HE-acknowledged role of the woodland invertebrates to the integrity of the SPA;

69.2. no assessment in that context of the nitrogen deposition, both for the DCO Scheme alone and in-combination with other plans and projects, that includes the contribution of ammonia from road traffic;

69.3. no assessment in that context of nitrogen deposition levels within the woodland <150m from the road;

69.4. no assessment in that context of the fact that the critical load of nitrogen deposition (10kgN/ha/yr for heathland and woodland) at this SPA is already exceeded for both woodland and heathland and will remain exceeded for the foreseeable future (see paragraph 64 above);

69.5. no consideration of the fact that the DCO Scheme will slow down the downward trend in nitrogen deposition;

69.6. no consideration of robust air quality data in relation to relevant nightjar (or other qualifying species') targets in the "European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring Site Features for the Thames Basin Heaths Special Protection Area (SPA)" dated 9 May 2016 (nightjar is the qualifying species for which, according to HE, the concern regarding woodland invertebrates is greatest, SIAA paragraph 7.2.23):

Restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk)

as well as

Maintain or restore the distribution, abundance and availability of key prey items (e.g. moths, beetles) at prey sizes preferred by Nightjar.

Penny Simpson
Partner
Freeths LLP
3 April 2020

FREETHS

APPENDIX

baker consultants
ECOLOGY DESIGN INNOVATION

Review of impact pathway of Nitrogen Deposition on invertebrates.

Andrew Baker FCIEEM
March 31st 2020

1. The RHS has already presented evidence to the inquiry on the deleterious effects of Nitrogen deposition- see 'Nitrogen as a threat to European terrestrial biodiversity' reproduced in Appendix 2 of Mr Baker's written representation (RHS/AB/1) (e.g. paras 12-14). This peer reviewed literature is comprehensive and incontrovertible, amassed over the last 40 years.

2. Nitrogen pollution can directly damage plants, but also acts as a fertilizer resulting in fundamental changes to habitats, changed species composition and a reduction in species diversity. It is for this reason that Natural England has, for the Thames Basin Heaths SPA, a specific conservation objective target for nightjar which is to 'Restore as necessary the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk)'11 and similar conservation objective targets for woodlark and Dartford warbler12.

3. It is therefore clear that nitrogen deposition from the DCO Scheme, either alone or in combination with other plans or projects, may adversely affect the populations of the invertebrates in the woodlands of the Ockham and Wisley Commons component of the Thames Basin Heaths SPA.

4. The invertebrates in the woodland are likely to provide a key source of food for the SPA qualifying species Nightjar, Woodlark and Dartford Warbler.

5. Moths and beetles form a major part of Nightjar prey items. Woodlark also feed on invertebrates including beetles and favour low vegetation and bare ground, where invertebrates are accessible to the birds (Bowden 1990).

6. HE agrees that the woodland contributes to the invertebrate resource for nightjars and woodlarks – see paragraphs 4.7.12 and 4.7.15 of the SIAA:

   "4.7.12…. However, the adjacent woodland areas within the SPA may contribute to the invertebrate resource of nightjars, by increasing the abundance of moths and beetles within the heathland areas, especially at the woodland edges"

   4.7.15….. However, the adjacent woodland areas within the SPA may contribute to the invertebrate resource of woodlarks, by increasing the abundance of invertebrates such as moths and associated caterpillars within the heathland areas.

[11] Thames Basin Heaths SPA Conservation Objectives Supplementary Advice, page 2 of 21
[12] Thames Basin Heaths SPA Conservation Objectives Supplementary Advice, page 8 of 21 and page 13 of 21

7. It is therefore clearly important to assess the impact of nitrogen deposition on the woodland.

8. The woodlands are low nitrogen environments which, in the absence of pollution, receive very limited Nitrogen loading. These ecosystems are therefore adapted to low Nitrogen availability in the soil and Nitrogen is, therefore, the main limiting factor in overall biomass production Vitousek & Howarth (1991). Increased nitrogen loadings tend to benefit some species much more than others. Generalist species, which are often identified as being invasive or problematic, benefit the most from the influx of additional nutrients, Corbin & D'Antonio (2004). The species that suffer the most are those that are adapted to cope with low Nitrogen levels, which are unable to compete in high Nitrogen environments (Ceulemans, Hulsmans, Berwaers, VanAcker, & Honnay, 2017; Hautier, Niklaus & Hector, 2009). Ultimately high Nitrogen levels lead to increased homogeneity and, therefore, lower biodiversity. Such changes are often profound and can affect the entire ecosystem.

9. Higher trophic levels (species higher up the food chain) are likely to be adversely affected by elevated Nitrogen levels because of adverse changes to plant composition. For example, Fox, Oliver, Harrower, Parsons, Thomas & Roy (2014) analysed population trends for 673 moth species in Britain between 1970-2010 and revealed that species associated with low Nitrogen environments had declined more than any other group. The study supported the hypothesis that *'Moth occurrence trends will be associated with host plant attributes (Ellenberg indicator values); specifically, moths that use types of plant that are in decline, such as those associated with low nitrogen soil conditions, will also be in decline.'*

10. The effect on beetles is somewhat more complex but ultimately negative. For example, Power, Ashmore, Cousins & Shepard (1998) found higher growth and reproduction rates of Heather beetle on lowlands heaths with elevated Nitrogen levels. Heather beetle may be a prey item of heathland birds, but the beetle causes significant damage to heathlands ultimately damaging the habitat (Natural England 2016).

11. Crucially, Natural England and Highways England themselves acknowledge that increases of nitrogen deposition from the DCO Scheme in the woodland will be significant (see NE/ HE SoCG 3.2.13) and also acknowledge that loss of invertebrates from the woodland could have an adverse impact on integrity of the SPA:

12. HE's SIAA states at paragraph 7.2.33:

> significant increases in nitrogen deposition resulting from the Scheme …could lead to a reduction in ….their [i.e. the SPA qualifying species'] invertebrate resource

13. HE's SIAA states at paragraph 7.2.20:

> *The loss of invertebrate resources* [from the woodland within Wisley and Ockham Commons component] *could have an impact on the following targets identified in the Natural England Supplementary Advice on Conserving and Restoring Features, and thus interrupt progress towards achieving the conservation objectives of the SPA, particularly with regards to nightjar.*
>
> *1. Food availability: Maintain or restore the distribution, abundance and availability of key prey items at prey sizes preferred by all three of the qualifying features;*
>
> *2. Extent and distribution of supporting habitat for the breeding season: Maintain the extent, distribution and availability of suitable breeding habitat which supports each of the three*

qualifying features for all necessary stages of their breeding cycle (courtship, nesting, feeding and roosting).

14. As such, it cannot safely be concluded that there would not be an adverse impact on the integrity of the SPA through the air quality impact pathway.

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Natural England 2016 A desk review of the ecology of heather beetle.