Dear Marina

Discretionary Advice Service (Charged Advice) DAS 12666/226010
DRAFT Ashdown Forest SAC: Air quality monitoring and modelling

Thank you for your consultation on the above dated 09 October 2017.

This advice is being provided as part of Natural England’s Discretionary Advice Service. Wealden District Council has asked Natural England to provide advice upon:

Ashdown Forest
Stage 1
- Review of air quality information
- Review of ecological information
- Confirmation if further analysis work ecology is required taking into account notes to ECUS
- Relevance of NE research into impacts on heathland from air pollution taking into account the situation now shown at Ashdown Forest
- Implications of recent EU judgement on historic in combination permissions

At Natural England's request, we provided advice on this last item outside of the DAS contract, on 1 February 2018.

Stage 2
- Natural England’s view including evidence and reference to the Habitat Regulations/ Directive any conclusions to be drawn, taking into account NE publications.

Whilst we have not yet provided a quotation for Stage 2, it was noted within the DAS request that elements of Stage 2 may fall into Stage 1. That is the case with this response.

This draft advice is provided in accordance with the Quotation and Agreement dated 9 October 2017. The following advice is based upon the information within:
• Air Quality and Ecological Monitoring and Modelling at Ashdown Forest: Considering the Current and Future Impacts on the SAC caused by Air Quality and Nitrogen Deposition, Report Ref 7565 Draft V12, Ecus Ltd (August 2017)
• Ashdown Forest SAC: Air Quality Monitoring and Modelling, Report number J2008/8/F2, Air Quality Consultants (19 October 2017)
• Air Quality and Ecological Monitoring and Modelling at Ashdown Forest: Considering the Current and Future Impacts on the SAC caused by Air Quality and Nitrogen Deposition, Report Ref 10678 Draft. Ecus Ltd (December 2017)

Summary
Wealden DC has undertaken a bespoke methodology for modelling inputs from the Local Plan, in combination with other plans and projects, on the Ashdown Forest Special Area of Conservation (SAC). Our overarching advice is that standard methodology should also be run so that the differences in output of the models can be checked. Our advice is based on the outputs of the model that Wealden District Council has used in their assessment. The output of this model indicates that air quality impacts from Wealden District Council’s Local Plan will have a likely significant effect on Ashdown Forest SAC alone or in combination with other plans and projects and further assessment is required under the Habitats Regulations.

We advise there is sufficient information included within the reports to undertake an AA and further ecological analysis should not be necessary

Our detailed comments on the ecology and air quality reports and the implications of the results on Ashdown Forest SAC, with reference to NE research reports, are within the attached Annexes. These comments have been prepared with Susan Zappala, Natural England’s air quality specialist

For clarification of any points in this letter, please contact me on 0208 026 8007.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority when relevant. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This
exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely

Marian Ashdown
Senior Adviser
Sussex and Kent Team
Marian.ashdown@naturalengland.org.uk

Cc commercialservices@naturalengland.org.uk
ANNEX A

Review of air quality and ecological information:

Air quality modelling methodology:

Wealden DC has undertaken a bespoke methodology for modelling inputs from the Local Plan, in combination with other plans and projects, on the Ashdown Forest. Our overarching advice is that standard methodology should also be run so that the differences in output of the models can be checked.

Standard methodology does not allow for diurnal or seasonal differences and attributes an average. The AQC model applies the specific differences however our advice is that as it is largely annual increases that are being assessed for likely significant effect and potentially adverse effect on integrity then use of the annual average is sufficient. Additionally, there are two standard deposition velocities generally used as described on APIS and within Environment Agency Guidance for grassland/moorland and woodland. These represent the highest and lowest deposition values. The bespoke model uses a total of 9 deposition velocities which again may be considered an added complication to the model and it is unclear what benefit this has brought.

It is not within Natural England’s remit to provide advice on whether this model is more suitable than a standard model but it is noted in para 6.1.170 of the AQC report that it cannot be stated that the standard deposition fluxes are incorrect. The report notes in para 6.1.166 that all models will have a level of uncertainty and in para 6.1.167 that some of the parameters used in the model are highly uncertain. Our advice is that a suitable model proportionate to the risk is appropriate.

Our advice on the outputs of the model are without prejudice and relate to the outputs of the model that Wealden DC has used.

Summary of previous advice

We sent initial comments on an earlier draft of the air quality and ecology report on 20 December 2017 which included requests for clarity on a number of points. A response was received from AQC on 22 January in relation to some of the points raised. I have repeated relevant comments below but removed those where AQC have provided clarity, those that are no longer considered relevant, or those that have been updated following receipt of the updated report.

This is a very thorough study and has a wealth of useful monitoring data and modelling verification to draw on including a very important update of habitat maps to demonstrate extent of habitat and survey data to indicate condition.

We welcome the calibration against automatic or delta samplers and to install in triplicate; this is considered very good practice.
The final habitat monitoring results warrant discussion, however these are rough initial comments that will be reviewed and updated once the next draft of the ecological report is received.

- There is a predicted increase in background concentrations of NOx and ammonia and subsequent nitrogen deposition. The question remains as to whether this is of a magnitude relatable to adverse effect or not.
- It is noted within the report that the heathland could be in better condition although some refinement of results could help unpick heathland results (transects primarily heathland) from other non-heathland results.
- Care should be taken to attribute any observed effect to nitrogen deposition or NOx/NHy concentrations even if there is a similar trend in magnitude with distance from road. However the high nitrogen content of tested plants is noted.
- Distinguishing effects from high background nitrogen deposition and contributions from the increase in traffic over the lifetime of the Local Plan will be important.
- Three years may not be enough to record change for some of the parameters measured.
  - Relevant extracts:
    - An analysis of the areas of change between 2014 and 2017 identified 14 areas of habitat change within 250 m from the roads (within the SAC boundary). These areas of change are limited in extent and total 0.63 ha in total.
    - 9.2.7 There is no difference in grass forb ratio within quadrats between years (all p>0.05) i.e. 2014 is statistically the same as 2015 and 2015 is the same as 2016.
    - 9.2.8 In general there is no significant relationships between grass:forb ratio and distance from road within a given transect within a given year i.e. no significant trends between grass:forb ratio and distance from road.
    - 9.2.10 The grass:forb ratio for a set distance is generally above the expected ratio for H2 and M16 habitats across all years.
    - 10.1.3 The expected correlation between foliar nitrogen concentrations and distance from road were not observed during this study. Figures 10.1 – 10.13 show that there is no statistically significant relationship between foliar nitrogen in either Hypnum or Calluna with distance from road.
    - 11.1.8 Taken as a whole there are inverse correlations between the nitrogen sensitive species and all modelled nitrogen values, indicating that these species are more prevalent at lower levels of nitrogen depositions. There is also a correlation between presence of these species and the presence of woodland belts, although the short length of the arrow relating to woodland belts indicates that it is not a strong contribution to the observed species variation.

Review of updated Air Quality and Ecological Monitoring report.

Following submission of the updated report on 9 January 2018, the following comments are
based on a review of Chapters 1, 3, 4, 7, 9 and 10 as requested of *Air Quality and Ecological Monitoring and Modelling at Ashdown Forest: Considering the Current and Future Impacts on the SAC caused by Air Quality and Nitrogen Deposition*, Report Ref 10678 Draft. Ecus Ltd (December 2017).

The historic air pollution section on the report contains a wealth of data. Whilst this is not directly relevant to the assessment for the Local Plan it is still interesting and provides context to the current air quality conditions on the Ashdown Forest.

1 Chapter 1

1.1.4 We recommend that the wording in this paragraph is amended for accuracy as the Conservation Objectives do not mention nitrogen deposition for the SAC [http://publications.naturalengland.org.uk/publication/6183967367626752](http://publications.naturalengland.org.uk/publication/6183967367626752) or the SPA [http://publications.naturalengland.org.uk/publication/6399918323269632](http://publications.naturalengland.org.uk/publication/6399918323269632)

It is the Ashdown Forest Site Improvement Plan that mentions air pollution as a pressure for heathland at Ashdown Forest SAC and SPA with a Shared Nitrogen Action Plan (SNAP) recognised as the method to implement measures to “Control, reduce and ameliorate atmospheric nitrogen impacts.” [http://publications.naturalengland.org.uk/publication/5793096570765312](http://publications.naturalengland.org.uk/publication/5793096570765312)

1.1.5 This applies to new development rather than all development. Existing operation development would typically be considered part of background pollution which should be addressed by National or local measures, such as SNAPs, rather than Habitats Regulations Assessment and consideration of individual permissions. See previous comments about SNAPs.

2 Chapter 2

2.1.1 We advise that this paragraph is amended to say that as a result of being above the threshold, further assessment was required. Being above the detectable level of change in emissions within a model (e.g. 1000 AADT in DMRB screening model) does not automatically mean that an effect on habitat is likely to occur. See comments on effects levels below.

2.1.2 (and throughout the report) – critical level and critical load have very specific meanings but are used interchangeably in the document. Except where referring to critical level in the context of concentrations of pollutants, this should be avoided. See APIS pages [http://www.apis.ac.uk/overview/issues/overview_Cloadslevels.htm](http://www.apis.ac.uk/overview/issues/overview_Cloadslevels.htm)

APIS cautions that for use of the critical load range for heathland several factors including precipitation, hydrology and historical management should be considered.

---

1 Important Note: Use the high end of the range with high precipitation and the low end of the range with low precipitation; Use the low end of the range for systems with a low water table, and the high end of the range for systems with a high water table. Note that water table can be modified by management; Use the high end of the range when sod cutting has been practiced; use the lower end of the range with low intensity management. (APIS)
These comments also apply for Chapter 4.

2.2.1 We advise that the wording is amended in this paragraph to “...adverse effect on site integrity” to more accurately reflect the test within the Habitats Regulations. Site integrity has very specific definitions related to the Conservation Objectives that feed into CSM survey parameters and subsequent condition reporting. Specifically those cited in paragraph 3.2.10; namely

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

It is against these parameters that the ecological portions of the survey will be analysed.

Further detail regarding the specific definition of site integrity is included in the “Information for Appropriate Assessment” section in Annex B.

3 Chapter 3

3.4.1 the 6-year cycle is not mandatory and frequency of monitoring may be more or less frequent depending on decisions by Natural England’s area teams/ site responsible officers.

3.42 to 3.4.4 – these attributes could be used to look at the Nitrogen Decision Framework. The Nitrogen Decision Framework (Jones et al 2016) also recognises that CSM was not designed to detect effects on all habitats from nitrogen deposition and the Framework was developed as a supplement to CSM.

The updated ecological monitoring protocol to account for CSM attributes and targets is welcome. Whilst this alignment is welcome, the limitations of CSM remain apparent when using these to attribute ecological change to effects of nitrogen deposition. The following is quoted or adapted from Nitrogen Decision framework “Factor 2 CSM strong N targets v1.xlsx”.

- CSM indicators for dry heath have 1 attribute with strong indication of nitrogen deposition and a weak score for confounding factors. This is Vegetation composition: bryophytes and lichens with a target measured by % cover maintained or increased (when naturally present).

“N is likely to affect the cover of many bryophyte and lichen species (Carroll et al, 1999; Southon et al, 2013; Field et al 2014). Cladonia portentosa and Cladonia uncialis have been identified as negatively sensitive to N (Emmett et al, 2011; Southon et al, 2013). In
survey work, the mosses Hylocomium splendens, Pleurozium schreberi and Dicranum scoparium are suggested as negatively sensitive to N (Gordon et al, 2001; Southon et al 2013; Field et al, 2014) and the moss Brachythecium rutabulum identified as positively correlated with N (Southon et al 2013; Field et al, 2014).

Confounding factors are considered including lack of cutting/burning which affect shading of bryophytes and lichen (Averis et al, 2004), lack of grazing and influence of climate (e.g. mosses prefer wet conditions and lichen prefer relatively dryer conditions). Experimental work in alpine areas has shown interaction between relatively low levels of nitrogen (ca 10 kg ha\(^{-1}\) y\(^{-1}\)) and burning that reduce lichen abundance in alpine heath communities (Britton and Fisher, 2007).

- Wet heath no CSM indicators that have strong attribution to effects of nitrogen deposition.

4 Chapter 4

It would be helpful to highlight where the negative effects cited as being caused by nitrogen deposition could also be caused by other factors including insufficient management. For example, shading cited in 4.2.3.

4.3.2 See comments in 2.1.2 on critical loads for heathland. The recommendation for using the lower end of the critical load is for screening for further assessment. Heathland critical loads have other considerations for where in the range is appropriate including precipitation, hydrology and historical management as described on APIS site relevant critical loads page for Ashdown Forest SAC.

4.3.3 The critical level for NO\(_x\) is not specific to any vegetation type and is generic however the critical level for NH\(_3\) is 3\(\mu\)g/M\(^3\) where lower plants are not an interest feature. Ashdown Forest has lower plants as a notified feature so we are satisfied that the lower critical level of 1\(\mu\)g/M\(^3\) has been used within the assessment.

4.3.4 The greatest relative declines in species abundance are for sites below critical load because nitrogen sensitive species may not have already been lost. When considering Ashdown Forest which is at/above the critical load for nitrogen deposition, the dose-response of heathland already loaded with nitrogen means a larger contribution of nitrogen would be required to result in further loss of species richness when compared to a site with much less nutrient loading (and thus more sensitive species). NECR210\(^2\) (as shown in Table 21) attempts to quantify this dose-response. For example, a lowland heath site with background pollution of 5kg N ha\(^{-1}\) y\(^{-1}\) would require an annual contribution 0.4kg per ha of extra nitrogen to lose a further point of species richness whereas a site at 15kg N ha\(^{-1}\) y\(^{-1}\) would require 1.3kg to generate the same loss in species richness.

5 Chapter 7

7.3.1 The label for the quadrat 5m from road should read QB instead of QA.

\(^2\) [http://publications.naturalengland.org.uk/publication/5354697970941952](http://publications.naturalengland.org.uk/publication/5354697970941952)
7.7.11 to 7.7.16 these correlative analyses can also highlight gaps in datasets and as noted in 7.7.14 and 7.8.15 relies heavily on professional judgment or controlled experiments.

7.8 This section goes some way to discuss uncertainties and that a bespoke research programme is required to know what is truly occurring at site level when meeting research level accuracy. However it is difficult to align this level of accuracy required with the uncertainty in monitoring, national modelling and benchmarks applied in decision-making which are all designed to cover a broad range of situations (eg critical loads have a range and are not one measure that is site specific). The Communication from the Commission on the precautionary principle\(^3\) clarified “\textit{The precautionary principle which is essentially used by decision makers in the management of risk should not be confused with the element of caution that scientists apply in their assessment of scientific data}”.

7.8.11 the descriptions provide degree as an indicator of nitrogen deposition but exclude confounding factor scores which make graminoid abundance as an overall weaker factor than lichen/bryophyte abundance when generating site specific scores within the Nitrogen Decision Framework.

7.8.12 Unfortunately the less confounded indicator of lichen/bryophyte was not included, however the graminoid abundance measure remains useful. It should be recognised that graminoid abundance does have more confounding factors than lichen/bryophyte abundance.

6 Chapter 8

In all quadrats, annual NOx critical level was not exceeded at 5m from the road. More often the short term critical level of 75 µg m\(^{-3}\) is exceeded; this level presumes exceedance of critical levels for SO2 and O3 as well. WHO\(^4\) also consider a 200 level µg m\(^{-3}\). When this is applied, all transects except J are below this level by 5m from the road:

“Experimental evidence exists that the CLE decreases from around 200 µg/m3 to 75 µg/m3 when in combination with O3 or SO2 at or above their critical levels. In the knowledge that short-term episodes of elevated NOx concentrations are generally combined with elevated concentrations of O3 or SO2, 75 µg/m3 is proposed for the 24 h mean.”

8.3.6 Are the higher levels closer to the road and then lowest levels furthest from road when vegetation is presumed to be heathland uniformly across transect?

8.5.6 It may be worth considering how the higher deposition to woodland affects conclusions about exceedance and likely effect on heathland via the Nitrogen Decision Framework. Maximum deposition to the entire SAC (consistent with numbers in 8.5.4) was used in the Nitrogen Decision Framework analysis – 24 kg N ha\(^{-1}\) y\(^{-1}\) and much higher than the average value of 15.4 or 15.6 for total deposition to dry and wet heath respectively in Table 8.7.

\(^4\) http://www.euro.who.int/__data/assets/pdf_file/0005/123098/AQG2ndEd_11no2level.pdf
Alternatively, the Nitrogen Decision Framework could be run for each of the individual transects to understand likelihood for impact based on model results. This could help pinpoint areas of most concern to highlight within the SNAP.

Chapter 9

Consideration of effects clearly address the Conservation Objectives cited in 3.2.10 which is welcome and makes interpretation easier.

9.1.4 Extent of wet and dry heath habitat does not seem to have significantly decreased over the study period (2014 to 2017) with limitations of interpreting aerial maps noted. The increase of 10ha of dry heath is also interesting whilst noting reference to management.

9.1.8 Analysis of habitat distribution within 250m of roads is more revealing but again highlights drivers of change such as management (Area 1) and nearby intensive use that likely involves fertilisers such as golf courses (Areas 9, 10 and 11) for dry heath. No areas of change for wet heath were reported.

9.2.9 to 9.2.39 There seem to be variations in habitat composition at each transect with no obvious relationship to distance from the road. The CCA provides little assurance that the relationship to distance from road is any more or less significant.

9.3 Grass:forb ratio did not change with distance from road although highest ratios were around 25 to 50m from the road.

9.4 Species richness actually increased closer to the road for transects where the change was statistically significant. This is consistent with observations in Cape 2004 related to physical disturbance, bare ground and species tolerance to disturbance as well as establishment by pioneer species.

9.5 Nitrogen Index - Whilst the relationship between distance from road and plant nitrogen index decreased, it would be helpful to understand how the Nitrogen Index range in this study reflects nutrient loading in the system. Would the range measured be indicative of high nutrient or nutrient poor systems?

9.8.6 Given previous results and lack of correlation to distance from the road it is difficult to see why soil sampling closer to the road is necessary.

9.9 It might be worth sharing C:N results with CEH to see if there is something more subtle at play.

9.10.1 This is consistent with understanding of emissions near roads with the effects from road traffic dropping quickly to 50m from the road and remaining consistent beyond this point (eg no longer influenced by road).

It is difficult to align this with the conclusion expressed in 9.10.3 due to the lack of relationship to the distance from the road and source attribution on APIS:

“Ashdown Forest clearly experiences significantly elevated rates of nitrogen deposition and it would seem that emissions from motor vehicles using the surrounding road network are a principal source of this pollution”
9.11 Detrended Correspondence Analysis (DCA) discussions mention that distance from road variable is high but does not mention that it is always lower than results for other summarised variables.

It would be helpful to have a reminder of the Axis values (or described as Environmental Variable Codes in 7.8) instead of solely referring to them by number.

1 - distance from road
2 – Grazing
3 - visitor pressure
4 - tree belt
Not summarised
5 AADT
6 modelled N at each quadrat

9.11.14 It is interesting that aspects such as bryophytes ad lichens considered to be strong indicators for nitrogen deposition with less confounding factors than graminoid show little relationship to distance from road or the other variables.

Graminoid, whilst showing a relationship, had a complex one which reflects the confounded aspect of using graminoid abundance as an indicator for nitrogen deposition, let alone distance from road.

8 Chapter 10

10.1.8 cites nitrogen index value and distance from road as the primary indicator of decline in habitat quality due to nitrogen deposition. It is difficult to align this conclusion with the actual range of index values (although they are statistically significant with distance from road) and the conclusions for all other indices to indicate ecological condition and relationship with distance from the road.

Throughout the report, confounding factors such as grazing and visitor pressure are highlighted, which when considered would seem to make it difficult to draw this conclusion. Additionally, studies of atmospheric pollution at road verges cite physical disturbance from vehicles, salt spray and particulates/debris as also explaining loss of vegetation (Cape et al 2004) although correlative studies on heathland record habitat change at 200 m from the road verge (Angold et al 2004).

Nitrogen can be contributed via non-atmospheric routes or atmospheric nitrogen from sources not related to road-traffic. It is unclear how these contributions are factored into the conclusions.

The work does show that current pollution may be affecting habitat at Ashdown Forest but it is difficult to then relate this to road traffic and proximity of habitat to the road. In light of this and results of national modelling where APIS Source Attribution indicates that the primary contributor to total nitrogen and local nitrogen respectively are European import and
livestock\textsuperscript{5}, a strategic approach to tackling background pollution is recommended (such as a SNAP).

Generally through the report, it is noted that background air quality is a pressure on Ashdown Forest but much of the specific ecological monitoring and analysis is generally unable to attribute road contributions to be a statistically significant contributor to this.

**Scenarios and outputs of the air quality modelling**

Paragraph 6.1.155 discusses the uncertainties regarding predicting future concentrations of NH3. AQC has assumed that in order to meet the stringent emissions targets within Euro 6 that manufacturers will “meet the challenge with more emphasis on SCR technology and potentially with higher dosing rates of the reagents which can give rise to NH3 emissions”. This is not in accordance with the later statement that the COPERT model produced by the European Environment Agency predicts there will be no change in NH3 emissions and that Defra’s predictions are that NH3 emissions from road traffic will reduce into the future (Defra 2012 as referenced by AQC). However we note that 2 scenarios have been used, one which assumes no change and one that assumes that NH3 will reduce in line with Defra predictions.

We note that a number of scenarios have been used but the most relevant appear to be Scenarios 3 and 5. This is noted in the air quality report at Section 6.1.154 which states “..Scenarios 3 and 5 provide a reasonable worst-case assessment, whilst Scenarios 2, 4, 6 and 7 provide an extreme worst-case upper-bound”. In our opinion, scenarios 2, 4, 6 and 7 use an unreasonable worst case scenario by assuming that there will be no background decreases from technological improvements.

Scenario 1 is the current baseline based on the on-site monitoring. The traffic data has been taken for a single year with some of the flows averaged over different periods of time. The on-site monitoring is considered to give a suitable baseline.

AQC have used a sensitivity model to allow for the previous overestimation of predicted improvements and note that this brings predictions into line with Copert V5.0. It is noted by AQC that Euro 6 vehicles now match the real world data however AQCs CURED model does not allow for expected improvements from unbuilt and untested future technology. This is considered appropriate and allows for a level of uncertainty over future improvements.

It would appear relevant at HRA screening stage to assess Scenario 5 against Scenario 3. This identifies the total PC from the plan in combination with other plans and projects against the same future baseline without the plan. Table 11.21 shows the process contribution of Nitrogen deposition that would come forward within the plan in combination. It would be useful to show these figures as percentage of critical load however simple calculation identifies the following (using only the relevant habitat types of wet heath and dry heath)

\textsuperscript{5} \url{http://www.apis.ac.uk/srcl/source-attribution?submit=Source+Attribution&sitetype=SAC&sitecode=UK0030080&sitename=Ashdown+Forest}
<table>
<thead>
<tr>
<th>Land Use</th>
<th>No development</th>
<th>With development</th>
<th>PC (N/ha/yr)</th>
<th>Max PC as % of lower CL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min</td>
<td>mean max</td>
<td>Min</td>
<td>mean max</td>
</tr>
<tr>
<td>Dry Heath</td>
<td>13.4 13.8</td>
<td>20.4</td>
<td>13.4 13.8</td>
<td>21.3</td>
</tr>
<tr>
<td>Wet Heath</td>
<td>13.5 14.0</td>
<td>19.6</td>
<td>13.5 14.0</td>
<td>20.3</td>
</tr>
</tbody>
</table>

CL range – 10 -20 N/ha/yr

It is noted that the min and average would be below 1% (no change at all identified within the figures) which is considered insignificant. However the max range would increase by up to 9% of the critical load.

Figure 11.51 demonstrates where an exceedance of more than 1% of the CL as identified in Table 11.21 would occur and is shown at better resolution in Appendix 1 drawings A1.225 to A1.228. Fig 11.52 compares scenario 5 against scenario 1 (existing baseline) which unsurprisingly shows a reduction in deposition as this takes future background improvements into account.

Whilst the nitrogen deposition component of NOx and NH3 is included within the nitrogen deposition results, there are no tables to compare scenario 5 against scenarios 3 or 1 for NOx and NH3 concentrations to specifically demonstrate maximum process contributions to dry and wet heath however the following figures are considered to be the most appropriate to assess.

Figure 11.44 (A1.218 to A1.220) maps the area where the PC of NH3 is more than 1% of the Cle when compared against the Scenario 3 background.

Figure 11.47 compares areas where the NH3 PC will be above 1% of the Cle against scenario 1 (existing baseline) where the PEC is predicted to be over 1ug/m3 although the figure does not appear to show any affect either positive or negative and has no key. Figure A1.245 shows this in more detail and identifies the only area to be affected is alongside the A26 and at the junction of B2026 with New Road.

There is discussion and figures relating to a PC of 0.008 against a CL of 0.8 for NH3 but these are not considered relevant as this is not the agreed critical level. This aspect is not considered further.

Figure 11.40 identifies where the 24-hour mean NOx will exceed the 75 µg/m3 critical level used where the predicted changes are over 10% of this critical level. The area extends to around 15m of the A22. However as noted in our comments above, our advice is that it is more appropriate to use the critical level of 200 µg/m3 where SO2 and ozone levels are not exceeded. SO2 levels have reduced considerably since 2000 and site-specific information from APIS identifies that the critical levels of SO2 on Ashdown Forest are significantly below the environmental benchmark.

Based on the outputs from this model, the background levels of nitrogen deposition on the site are over the CL and the PC is above 1% of the lower end of the CL within some areas close to the roads. As features sensitive to air quality are within the areas to be impacted this indicates that the impacts from the Local Plan are considered to have a likely significant
effect on Ashdown Forest SAC. Our advice is that a full appropriate assessment will be required to assess whether this contribution would have an adverse effect on the integrity of the site.

Our advice is that there is sufficient information included within the reports to undertake an AA and further ecological analysis should not be necessary.

References


Rowe EC, Ford AES, Smart S, Henrys P & Ashmore M (2016) Using qualitative and quantitative methods to choose a habitat quality metric for air pollution policy evaluation. PLOS-ONE. http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0161085

ANNEX B

Wider Context

DEFRA/Department of Transport’s UK plan for tackling roadside nitrogen dioxide concentrations (July 2017) is a useful reference to the Government’s position regarding the existing and future impact of transport on background air quality, including ecosystems, and can be found at the following link: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/633270/air-quality-plan-detail.pdf. The plan provides detail of the existing actions which are being taken by Government and additional actions to which the Government is committed.

Natural England is also committed to including wider air quality improvement measures through Shared Nitrogen Action Plans (SNAPs) for those designated sites where air quality impacts are considered to be a pressure. These are included within the Site Improvement Plans (SIPs) for relevant designated sites.

General approach advised for HRA screening of air quality impacts

This is generally a stepwise approach to screen out at an early stage whether further consideration is needed.

- Check Distance Criteria and APIS introduction to air pollution
- Habitat sensitivity to that emission type (See Site Relevant Critical Load)
- Where practicable, check the likely exposure of the site’s sensitive features to emissions
- Ascertain the process-contribution (PC) from the plan or project. This can be either by consideration of the Annual Average Daily Traffic Flow (AADT) or the % of Critical Load/Level benchmark
- Apply screening threshold (either an increase of 1000 AADT or whether the PC is above 1% of the Critical Load/Level benchmark) alone
- Apply screening threshold in-combination

APIS provides information about background pollution concentrations for each European site through the Site Relevant Critical Load Tool (on the Concentrations/Deposition tab). Projects and plans operational on or before dates included in background pollution data on APIS are typically considered as an integral part of the background. The same applies for site specific data where the air quality measurements would include those plans or projects already operational. These should not be included as projects or plans for in-combination assessment as this would effectively be double-counting the emission sources. The exception would be for parts of projects or plans not yet operational.

In general terms, it is important to remember that the subject plan or project remains the focus of any in-combination assessment. Therefore, it is Natural England’s view that care should be taken to avoid unnecessarily combining the insignificant effects of the subject plan or project with the effects of other plans or projects which can be considered significant in their own right. The latter should always be dealt with by its own individual HRA alone. In other words, it is only the appreciable effects of those other plans and projects that are not
themselves significant alone which are added into an in-combination assessment with the subject proposal.

Should screening thresholds be exceeded to indicate that there is a risk of a significant effect, this may mean that more minor plans or projects become immaterial to the in-combination assessment and can be discounted.

Where the designated site has features that are sensitive to air quality impacts, if these features are within the area where a threshold will be exceeded and the background is over the environmental benchmark then there is a credible risk of impacts (i.e. a likely significant effect) and the HRA should move forward to an Appropriate Assessment.

Considerations for an Appropriate Assessment

The conservation objectives and citation for the SAC can be found at the following link: [http://publications.naturalengland.org.uk/publication/6183967367626752?category=6528471664689152](http://publications.naturalengland.org.uk/publication/6183967367626752?category=6528471664689152) and it may also be helpful to refer to the Site Improvement Plan (SIP) [http://publications.naturalengland.org.uk/category/6149691318206464](http://publications.naturalengland.org.uk/category/6149691318206464)

Ashdown Forest contains a mosaic of habitats including woodland which is not a notified feature of the SAC but is a feature of the SSSI designation. Where exceedances are affecting woodland, this should be disregarded in the AA and only exceedances affecting the notified features of dry heath and wet heath should be assessed.

Our advice is that where an existing national, regional or local initiative can be relied upon to lead to the reduction in background levels of pollution at a site, the competent authority should assess the implications of a plan or project against an improving background trend. Scenario 1 is the current background so assessing scenario 5 against scenario 1 would enable WDC to assess the PC of the Local Plan (in combination) in comparison to the current background. As scenario 5 includes the expected emissions improvements the results show that there will be an overall improvement in nitrogen deposition. Scenario 5 checked against scenario 3 (future baseline taking into account improvements) identifies the percentage of critical load/level that would “retard” the background improvements expected to come forward.

In favourable conservation status terms, the existing background levels, whilst noted as a “pressure” on the site’s objectives in the SIP, have not been specifically identified as being responsible for the condition of SSSI units which are currently recorded as ‘unfavourable recovering’ as it is difficult to distinguish air quality impacts from other factors such as trampling, management, etc.

As noted previously and within the Site Improvement Plan, we are committed to developing a shared nitrogen action plan (SNAP) for Ashdown Forest to address the more strategic issue of reducing background air quality levels on the site.

The AQC reports include a wealth of useful information that may help with this. Now that 3 years of data are available from the monitoring programme it would be valuable to discuss the results in relation to historical data, plans for future development and any measures considered. We welcome the opportunity to work with stakeholders to implement
appropriate measures within an agreed SNAP and this will hopefully provide an added level of confidence within Plan reviews of an overall downward trend in background emissions.

When assessing likely adverse effects on site integrity in an appropriate assessment, the Natural England Commissioned Report 210: *Assessing the effects of small increments of atmospheric nitrogen deposition (above the critical load) on semi-natural habitats of conservation importance* (referred to above) may be of relevance.

This research shows that habitats that have already been subject to high background nitrogen deposition can develop an effective tolerance to the effects of further deposition. However, it is not appropriate to use this evidence to justify further exceedance on designated sites in the absence of considering all available factors and information and where this would undermine the conservation objectives to reverse this and restore pollutant levels to within an acceptable level.

The objective of the NECR210 report was to examine recent vegetation survey data to understand the relationships that exist between species (composition and richness) and nitrogen deposition, and to determine the effect of incremental increases in nitrogen. Vegetation data were analysed from 226 sites, collected over 8 surveys of 5 UK priority habitats for conservation (sand dune, bog, lowland heath, upland heath, acid grassland). Further evidence was gained from published survey data and the network of UK nitrogen addition experiments. Thursley in Surrey was included in the site data analysed and would be expected to be subject to similar meteorological conditions to Ashdown Forest. We can therefore be confident that the sites surveyed do include habitat representative of the conditions at Ashdown Forest.

This report provides detail about how much additional nitrogen might lead to a loss of one species. Table 21 identifies that where a lowland heath has a background of 20kg/ha then the increase in N deposition required to reduce measured species richness by 1 would be 1.7 kgN/ha/yr. The outputs from the Ashdown Forest modelling have identified that the maximum PC is 0.9 kgN/ha/yr which is well below the level expected to reduce species richness.

In order to undertake the AA, it may be necessary to determine the specific amount of habitat affected where the PC is over 1% of the relevant CL/CLes and where the PEC is above the environmental benchmark. Areas where notified features are not present (such as woodland) do not need to be considered. The figures within the AQC report that relate to the outputs of the Ashdown Forest modelling identify areas of exceedances and these should be compared against habitat data in the aerial mapping and in the ecology report. However it is not clear as to whether the figures are sufficient from which to be able to provide a reasonable estimate of affected notified features.

General principles for Appropriate Assessment

Under the Habitats Regulations, a Competent Authority is responsible for undertaking an Appropriate Assessment. Having established that a plan or project is likely to have a

---

6 http://publications.naturalengland.org.uk/publication/5354697970941952
significant effect, the purpose of the assessment is to ascertain, in view of the site's conservation objectives, whether a plan or project will adversely affect the integrity of a European site.

The ‘integrity’ of a site should be taken to mean the coherence of its ecological structure and function, across its whole area that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was, or will be, designated or classified. A site can also be described as having a high degree of integrity where ‘the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained and a minimum of external management is required’ (European Commission, 20007).

As a general point; if, upon closer examination, the qualifying feature which is considered to be sensitive is shown not to be present within an area predicted to be affected by emissions (and Natural England’s advice is that there is no conservation objective to restore the feature to that area), it will be relatively straightforward to ascertain that the plan or project poses no credible risk to it and there is unlikely to be an adverse effect on the site’s integrity.

For Special Areas of Conservation, the conservation objectives are to:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring…

In terms of whether there is an ‘adverse’ effect, the Advocate General’s Opinion in Sweetman8 indicated that, in her view, a plan or project involving ‘some strictly temporary loss of amenity which is capable of being fully undone’ would not be an adverse effect on integrity. By comparison, the ‘lasting and irreparable loss’ of part of the SAC feature in Sweetman9 was ruled to be an adverse effect on integrity.

In practice therefore, where a site is already exceeding a relevant benchmark, the extent to which additional increments from plans and projects would undermine a conservation objective to ‘restore’ will involve further consideration. This may include consideration of whether there is credible evidence that the emissions represent a real risk and whether the ability of other national or local initiatives to otherwise reduce background levels will be compromised in a meaningful manner. This is a judgement which should be informed by, amongst other things, the extent to which any declining national trends in air pollution or strategic work to tackle emissions affecting the site more locally might otherwise lead to improvements, the rate at which such improvement are anticipated to be delivered, any credible evidence on the extent of the impacts of a plan or project and whether those impacts can properly be considered temporary and reversible.

We advise that factors already affecting the site but which are not related to the plan/project being assessed count as the current prevailing or background conditions. These factors may be unacceptable independent of the proposal being assessed (and should be

8 Advocate General Opinion in Case C-258/11 Sweetman (refer paras 58-61)
9 Case C258-11 Sweetman (refer para 56)
addressed separately) but nevertheless may be currently undermining the site’s resilience to any new and additional pressures

**Consider the best available evidence on small incremental impacts from nitrogen deposition**

A Natural England research report (NECR205) on how small scale effects\textsuperscript{10} on European Sites have been considered in decision-making is of relevance here. Where the spatial extent of the affected area is small then the risk to the integrity of the site needs to be approached in a reasonable and proportionate manner. The Research Report concluded that:

‘In the case of small scale effects on a qualifying Annex 1 habitat type for which a SAC had been designated, the decisions reviewed suggest that it is the relative importance of the area affected in terms of the rarity, location, distribution, vulnerability to change and ecological structure which is most influential. The contribution the affected area made to the overall integrity of the site (and hence that site’s contribution to the conservation status of that habitat type at a member state level) exerted a stronger influence over decision makers than the spatial extent of the effect.

---

\textsuperscript{10} CHAPMAN, C. & TYLDELEY, D. 2016. *Small-scale effects: How the scale of effects has been considered in respect of plans and projects affecting European sites - a review of authoritative decisions.* Natural England Commissioned Reports, Number 205.