

File Note: Appropriate Assessment of air pollution

Enfield Local Plan HRA

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This note sets out the results of our study into the potential impact of air quality (AQ) screening threshold exceedances resulting from the Enfield Local Plan on Epping Forest Special Area of Conservation (SAC). It updates and supersedes our note of 27 February 2024, to take into account the following:

- Updated traffic modelling and air quality assessment work by WSP**, which has reduced the number of points at which exceedances of the screening thresholds are predicted. The modelling was updated to reflect changes to TfL's London Highway Assignment Model, and to more accurately model traffic from the Crews Hill and Chase Park site allocations (see WSP's technical note on traffic, 3 July 2024). The updated AQ assessment has not yet been written up by WSP but they have shared their GIS data with us, which has informed this note. Whilst LUC's previous note and site visits were based on WSP's original AQ assessment which showed acid deposition exceedances, this revised note reflects the revised modelling which identifies Ndep, NO_x and NH₃ exceedances.
- Natural England's comments on acid deposition**, following discussion on the February note: *"Clay bedrock does have a buffering function we know but how much this would mitigate any impact from acidification depends on more detail. In what vegetation is in those areas and is there an existing/potential impact from acidification. Dependant on the soil profile (ie how much acid soil is on top of the clay bedrock), if there are already acid loving plants there (and interest features) with shorter root stock where the buffering is not having its own effect then the acidification would be impacting the interest features. [However] acidification is not likely to be a big issue on the site anyway. This is more of an issue in the North with significant industrial process (and associated higher SO_x levels) , and besides, any mitigation (ie the Epping CAZ) for NO_x etc will also mitigate for any potential acidification impacts."*
- Natural England's comments on in-combination exceedances**, during discussion on the February note, that Enfield's contribution to in-combination exceedances are generally not of concern; however, there are some instances where Enfield is contributing a relatively large proportion to the in-combination exceedance, but where the screening criteria 'alone' is not met. We have added those to the transect points discussed in this note.
- Site visits undertaken by LUC** in June and July 2024 to confirm whether qualifying habitats are present at transect points predicted to exceed in-combination screening criteria, where Enfield Local Plan has a relatively large contribution to that

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exceedance. The transect points were as identified in WSP's original modelling; the revised modelling means that some of the locations visited are no longer predicted to exceed the screening criteria.

- **Natural England's comments** on a version of this note issued 21 August 2024. Comments received 3 September 2024 requested clarification of conclusions around whether conservation objectives can be met.

Methodology

In order to assess the potential impact of the AQ exceedances at the SAC, we have undertaken the following tasks which are summarised in the note below:

- Desktop and site visit assessment of the SAC habitats present in these areas, condition of habitats and vulnerability/sensitivity to the AQ pollutants;
- Calculation of the approximate area of the SAC which is potentially impacted by the exceedances

Natural England (NE) guidance¹ on air quality has been used in the formation of this note:

- Step 1: the Local Plan does give rise to emissions which are likely to reach a European Site (Epping Forest SAC);
- Step 2. The SAC qualifying features are within 200m of a road sensitive to air pollution;
- Step 3 Sensitive qualifying features of the SAC are exposed to emissions;
- Step 4 Application of screening thresholds.

Step 1: Locations of AQ screening criteria exceedance

Summary of WSP's AQ assessment

Table 1 summarises the results of WSP's AQ assessment and whether or not the traffic screening criteria (>1,000AADT) was exceeded in each location for the Local Plan 'in combination'. None of the road links exceed >1,000AADT for the Local Plan alone. For each pollutant, the table shows the furthest distance from the centre of the road ('Dist.')

at which there is an exceedance of AQ screening criteria, and what the change in pollution is, as a % of the pollutants' critical load/level ('% CL'). Road links are listed from north to south.

As the transect points were measured from the centre of the road, some are at kerbside, where the road is wide. In addition, where ten metres from the centre of the road did not fall within the SAC, WSP has used the intersection between the SAC and the transect as the nearest point. In some cases this therefore means that the '10m' and 20m transect points are less than ten metres apart.

¹ Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations
Version: June 2018

Table 1 Summary of WSP AQ assessment results

Road link	N dep.		NO _x		NH ₃		Acid dep.		Notes	Is traffic screening criteria exceeded for Local Plan in combination?
	Dist.	% CL	Dist.	% CL	Dist.	% CL	Dist.	% CL		
Local Plan alone										
A121 near Manor Rd jcn (ECO19)	10m	1.25%	-	-	10m	1.50%	-	-	10m transect point at kerbside	No: <1,000 AADT
Brook Road between Epping New Rd & A110 (ECO28)	10m	1.50%	-	-	10m	2.71%	-	-	10m transect point at kerbside	No: <1,000 AADT
A110 at Forest Side jcn (ECO22)	10m	1.08%	-	-	10m	1.35%	-	-	10m transect point at back of footway	No: <1,000 AADT
A110 between Brook Road and Forest Side (two transects ECO23 & ECO24; worst case used)	-	-	-	-	10m	1.18%	-	-	10m transect point at back of footway	No: <1,000 AADT
A110 at Brook Rd jcn (north ECO26 and south ECO27; worst case used)	10m	1.36%	-	-	10m	2.00%	-	-	10m transect point c.2m from kerbside	No: <1,000 AADT
Local Plan in combination										
B1393 nr M25 (A3)	20m	1.11-2.50%	-	-	20m	1.16-2.81%	10m	1.03%	10m transect point at kerbside	No: <1,000 AADT
A121 near Woodgreen Rd jcn (O)	10m	1.79%	-	-	20m	1.09-2.15%	-	-	10m transect point at kerbside	Yes: >2,000 AADT
A121 between Epping Rd and Woodredon Farm Ln; north side (E2)	10m	1.90%	-	-	10m	2.40%	-	-	10m transect point at kerbside	Yes: >2,000 AADT
A121 between Epping Rd and Woodredon Farm Ln; south side (E1)	10m	1.59%	-	-	10m	2.00%	-	-	10m transect point at kerbside	Yes: >2,000 AADT
B172 between Epping Rd & Forest Rd; north side (two transects B2 and B2a; worst case shown)	60m	1.00-8.67%	20m	1.12-2.49%	60m	1.07-9.69%	20m	1.51-3.57%	10m transect point c.2m from road edge	Yes: >2,000 AADT
B172 between Epping Rd & Forest Rd; south side (B1)	40m	1.13-6.69%	10m	1.99%	40m	1.19-7.4%	20m	1.15-2.75%	10m transect point c.2m from road edge	Yes: >2,000 AADT

Road link	N dep.		NOx		NH ₃		Acid dep.		Notes	Is traffic screening criteria exceeded for Local Plan in combination?
	Dist.	% CL	Dist.	% CL	Dist.	% CL	Dist.	% CL		
Earl's Path (J)	40m	1.01%-7.24%	20m	1.38-3.70%	30m	1.38-7.12%	20m	1.06-2.98%	10m transect point at kerbside	No: <1,000AADT (and Local Plan alone shows a reduction in traffic)
Brook Road between Epping New Rd & A110 (ECO28)	10m	1.22%	-	-	10m	2.27%	-	-	10m transect point at kerbside	No: <1,000 AADT
Monkham's Lane nr Orchard Ln (ECO33)	10m	1.21%	-	-	10m	1.51%	-	-	10m transect point at kerbside	No: <1,000 AADT
A104 / A503 / A406 jcn (ECO43)	-	-	30m	1.21-2.66%	-	-	-	-	10m transect point is <2m from kerb	Yes: >2,000 AADT
A114 Whipps Cross Road near A104 (ECO49)	30m	1.20-5.35%	60m	1.02-4.99%	30m	1.36-4.20%	20m	1.01-2.20%	10m transect point at kerbside	Yes: >3,000 AADT
A114 Whipps Cross Road near Preston Road (ECO51)	30m	1.07-2.63%			30m	1.17-4.94%	12m	1.08%	First transect point is at 12m from the road centre	Yes: >3,000 AADT
A1199 nr A113 jcn (ECO52)	10m	1.59%	-	-	20m	1.14-1.89%	-	-	10m transect point at kerbside	Yes: >1,000 AADT

Locations which exceed AQ exceedance but not traffic screening criteria

At Earl's Path, there is an exceedance of air pollution screening criteria for the Local Plan in combination, but a reduction for the Local Plan alone. The increase is therefore not due to the Enfield Local Plan and this transect has been screened out.

If transects were screened on the basis of the traffic criteria alone, then the following would also be screened out:

- All of the Local Plan 'alone' exceedances;
- B1393 nr M25;
- Brook Road between Epping New Rd & A110; and
- Monkham's Lane nr Orchard Ln.

However, as these transects do show an exceedance of the air pollution screening criteria, we have taken a precautionary approach and considered the potential effects in these locations (IAQM guidance suggests that either 1,000AADT or 1% of critical load is used as a screening threshold).

Steps 2 & 3: Qualifying features within 200m of the affected locations

Qualifying features of the SAC

Reasons for SAC selection

Annex I habitats that are a primary reason for selection of Epping Forest SAC are:

- 9120 Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrub layer (*Quercion robori-petraeae* or *Ilici-Fagenion*). Epping Forest represents Atlantic acidophilous beech forests in the north-eastern part of the habitat's UK range. Although the epiphytes at this site have declined, largely as a result of air pollution, it remains important for a range of rare species, including the moss *Zygodon forsteri*. The long history of pollarding, and resultant large number of veteran trees, ensures that the site is also rich in fungi and dead-wood invertebrates.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site are:

- 4010 Northern Atlantic wet heaths with *Erica tetralix*
- 4030 European dry heaths

Annex II species that are a primary reason for selection of this site are:

- 1083 Stag beetle *Lucanus cervus*. Epping Forest is a large woodland area in which records of stag beetle are widespread and frequent; the site straddles the Essex and east London population centres. Epping Forest is a very important site for fauna associated with decaying timber, and supports many Red Data Book and Nationally Scarce invertebrate species.

Conservation Objectives

The following Conservation Objectives are set out for Epping Forest SAC (Natural England, 2014): With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change:

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:

- 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.

Site Improvement Plan (SIP) and supplementary advice for conservation objectives

NE's Epping Forest SIP (dated 12.12.16) includes 'Air pollution: impact of atmospheric nitrogen deposition' as a priority issue (a 'pressure' rather than a 'threat') to H4010 Wet heathland with cross-leaved heath, H4030 European dry heaths, H9120 Beech forests on acid soils. The action measure is to 'Establish a Site Nitrogen Action Plan' (with NE as delivery body). It states that '*nitrogen deposition exceeds site-relevant critical loads for ecosystem protection. Some parts of the site are assessed as in unfavourable condition for reasons linked to air pollution impacts*'.

This indicates that nitrogen deposition is the key issue for NE at Epping Forest.

Other relevant NE advice² sets out more detail on potential air quality impacts at the SAC. Again, the key pollutant is nitrogen, with impacts in relation to acid deposition restricted to impacts from ammonia. The supplementary advice for conservation objectives for the site provides additional guidance on how the SAC's conservation objectives can be met in relation to air quality. For all of the qualifying habitats, the target is to "*Restore as necessary, the concentrations and deposition of air pollutants to at or below the site-relevant Critical Load of Level values given for this feature of the site on the Air Pollution Information System (www.apis.ac.uk).*" For the qualifying species (stag beetles), the target is to "*Maintain or, where necessary, restore...*".

Site condition assessment

A total of 27 SSSI units were impacted by the AQ exceedances of which 16 (59%) were in unfavourable recovering condition, 5 (19%) in favourable condition, 5 (19%) in unfavourable no change and 1 (3%) in unfavourable declining condition. Therefore, 97% of the SSSI units potentially impacted by the Local Plan Alone scenario are not deteriorating in condition, despite recent increases in traffic using nearby roads.

All these units are sensitive to ammonia and nitrogen deposition according to the Site Improvement Plan. The woodland habitats/units are sensitive to 'Acid deposition, NH₃, nitrogen deposition, SO₂' according to APIS and the grassland habitats/units sensitive to 'Acid deposition, nitrogen deposition'.

The 27 SSSI units potentially impacted comprised 65 separate 'parcels'. Of these 45 were broad-leaved woodland (forest, 69%), 9 were mixed forest, grassland, scrub and open space (14%), 8 were dwarf shrub heath (12%), 2 were grassland (3%) and one was open water (2%).

Types of habitat potentially impacted

Once exceedances are identified, NE guidance¹ states that the next step is to check that the qualifying habitats for which Epping Forest SAC is designated for (i.e. Atlantic acidophilous beech forests, Northern wet heaths or European dry heaths) are located within the parts of the SAC identified as lying within the exceedances zone.

The vegetation which comprises Atlantic acidophilous beech forests within Epping Forest SAC falls within the following three UK National Vegetation Classification (NVC) community types:

- W14 Beech *Fagus sylvatica* -Bramble *Rubus fruticosus* woodland
- W15 Beech *Fagus sylvatica* – wavy hair grass *Deschampsia flexuosa* woodland
- W10 Oak *Quercus robur* – Bracken *Pteridium aquilinum* -Bramble *Rubus fruticosus*

The vegetation which comprises Northern wet heaths within the SAC mostly consists of the following NVC community M16 Cross-leaved heath *Erica tetralix* – compact bogmoss *Sphagnum compactum* wet heath, whereas the European dry heaths community is H1 heather *Calluna vulgaris* – sheep's fescue *Festuca ovina* heathland. Whilst NVC survey data is not available for Epping Forest SAC, a broad assessment of the qualifying habitats within the SAC was taken using the following data sources:

- Aerial photography;

² European Site Conservation Objectives: Supplementary advice on conserving and restoring site features Epping Forest Special Area of Conservation (SAC) Site Code: UK0012720 Date of Publication: 23 January 2019

- Natural England website information;
- Defra's MAGIC Map;
- Other sources e.g. Local Plan studies, ecological reports of proposed developments in the area, veteran tree and scarce species data from the Epping Forest Conservators.

Using this information and the condition assessment information above, exceedances are located in a variety of woodland, heathland and grassland habitats. Whilst most would come under the Annex 1 beech and heathland habitats for which the SAC is designated, some do not, e.g. areas of apparent oak woodland.

For example, the previous surveys undertaken for the Meridian Water development found that the habitat within 200m of the A406 North Circular Road comprised oak woodland (itself not a qualifying feature of the SAC) and further that no veteran trees or scarce species were recorded within 200m of the A406. In addition, areas of the SAC alongside roads generally have a lower sensitivity to air pollutants and contain lower value habitats due to the general presence of the road and its associated salt spray, dust, runoff, and altered drainage or soils.

Presence of qualifying features adjacent to roads

Measurement of distance from the road edge

Guidance from the Institute of Air Quality Management³ states that, when carrying out an AQ assessment of impacts at nature sites:

"Concentrations should not, however, be predicted too close to the roadway, since such predictions can be unreliable and may not represent areas of relevance to the assessment. It is recommended, for example, that predictions are not made closer than 2 m from the edge of a road."

WSP's AQ assessment used 200m transects with points at 10m intervals (i.e. 20 points per transect). These were measured from the road centre line, rather than from the edge of the road. This means that, in nearly all of the cases, the first transect point (10m) is less than two metres from the road edge. Where that is the case and the 10m transect point is only the point that exceeds the AQ screening criteria, we have screened out the transect.

This applies to the following road links and these are therefore screened out:

- A121 near Manor Rd jcn;
- Brook Road between Epping New Rd & A110;
- A110 at Forest Side jcn;
- A110 between Brook Road and Forest Side (two transects);
- Brook Road between Epping New Rd & A110; and
- Monkham's Lane nr Orchard Ln.

Habitat degradation near to roads

In addition, exceedances up to 20m are also screened out. Given that the first 10m is primarily road (see above) we assume that the next 10m contains degraded habitats i.e. contains lower value habitats due to the general presence of the road and its associated salt spray, dust, runoff, and altered drainage or soils; and in some cases are road verges and official and unofficial cycle paths and tracks. This applies to the following road links:

- B1393 nr M25: N dep & NH₃ exceedance at 20m;
- A121 near Woodgreen Rd jcn: NH₃ exceedance at 20m;

³ <https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf>

- A121 between Epping Rd and Woodredon Farm Ln; north & south side: road width not known, but N dep & NH₃ exceedance at 10m transect point; and
- A1199 nr A113 jcn: NH₃ exceedance at 20m.

Non-qualifying habitats

The following transect points have been screened out on the basis of desk study, because it is clear from desk study that the SAC's qualifying features are not present:

- A114 Whipps Cross Road (three transects): NO_x exceedance at 60m, NH₃ exceedances at 50m; N dep exceedance at 30m. The 60m NO_x in-combination exceedance and the 30m Ndep exceedance, on the south side of Whipps Cross roundabout, for the first 20m from the middle of the road would be road and cycle path (hard standing). From aerial images, the remaining 30m comprises oak woodland and open bramble, not qualifying SAC features. The NH₃ in-combination 50m exceedance and the other 30m Ndep in-combination exceedance impact Leyton Flats which is open grassland, not an SAC qualifying feature. Therefore, these Whipps Cross exceedances can be screened out.

Site visits

LUC undertook site visits to Epping Forest SAC in June and July 2024, to visit locations at which the previous WSP AQ assessment identified as exceeding screening criteria for acid deposition, where the Enfield Local Plan contributed a significant proportion of the in-combination exceedance (as identified by Natural England). These were visited as they were the locations at which it had not previously been possible to screen the locations out through desk study. The results of the site visits are appended to this note.

The majority of the locations visited are no longer predicted to exceed the AQ screening criteria. Of those that are, five were screened out (as above) because the exceedance occurs within two metres of the road edge only:

- A110 at Forest Side jcn;
- A110 between Brook Road and Forest Side;
- Brook Road between Epping New Rd & A110; and
- Monkham's Lane nr Orchard Ln.

The following locations were surveyed that have not been screened out as a result of the model update or proximity of exceedances to the road:

- B172 between Epping Rd & Forest Rd; north & south side (two transects): all pollutants esp N dep & NH₃. No qualifying features on north side. Qualifying features on south side.
- A121 near Woodgreen Rd jcn: no qualifying habitat present.
- A121 between Epping Rd and Woodredon Farm Ln: qualifying habitat partially present. No veteran trees or pollards present but young beech trees present and understorey of holly.
- A110 at Brook Rd jcn: no qualifying habitat present on north side. Partially present on south side- mature broadleaved woodland but oak dominated with absence of veterans and pollards. Holly abundant in shrub layer
- A104 / A503 / A406 jcn (south): qualifying habitat present. Mature broadleaved woodland incorporating veterans and pollards with holly understorey.

Approximate area of the SAC that could be impacted by the exceedances

For each exceedance, areas of SAC were estimated on GIS by forming polygons using the depth of exceedance and the length of road affected by the exceedance (taken to the nearest road junction – as this corresponded with either a new stretch of exceedance or a change into non SAC designation). The areas of these polygons were then calculated, producing approximate areas impacted.

The following table sets out the results, including Local Plan (LP) alone calculations and also ‘in-combination’ assessments. The resulting areas were then compared to the overall size of the SAC to give an approximate % of the SAC potentially impacted by each pollutant exceedance.

Table 2: Area of SAC affected by AQ exceedances

Pollutant	Exceedances due to Local Plan alone		Exceedances due to Local Plan in-combination	
	Area affected (ha)	% of total SAC area	Area affected (ha)	% of total SAC area
N deposition	0.2	0.01	4.7	0.29
NH ₃	0.2	0.01	5.1	0.32
NO _x	0	0	2.4	0.15
Acid deposition	0	0	3.0	0.19

As shown in Table 1 above, all five of the Local Plan alone exceedances only impact 10-20m from the centre of the road, i.e. only impacting the first few metres of the SAC from the road. Of the in-combination exceedances, eight of the 13 instances only affect 10-20m of the SAC.

Step 4: Application of screening thresholds

Discussion on areas affected by the Local Plan Alone (NE Step 4a)

In terms of the Local Plan Alone, none of the exceedances for ammonia (NH₃), or nitrogen deposition were significant, as explained below.

For NH₃ and N deposition, only 0.01% of the SAC’s total area is predicted to exceed the AQ screening criteria, and the majority of these locations are within two metres of the roadside. The only transects where an exceedance is predicted further from the road is 20m from the centre of the A110 at Brook Rd jcn (north and south). At this location, no qualifying habitats are present on the north side, but are partially present on the south side (see ‘site visits’). Habitats within 20m of the roadside are considered likely to be degraded by proximity to the road (see ‘habitat degradation near to roads’); the affected transect points have therefore been screened out due to a lack of, or poor quality of, qualifying habitats. Exceedances would also decrease rapidly from the roadside⁴.

The impacts of NH₃ and N deposition are not considered to be significant in terms of the integrity of the SAC.

Discussion on In-Combination impacts (NE Step 4b)

Area affected

The in-combination exceedances in total impact less than 1% of the SAC (between 0.15% and 0.32%); and, as with the effects of the Local Plan alone, the majority of the exceedances are at the road edge or reduce rapidly away from the road. This is a very small area of the SAC; however the effect on qualifying habitats and the ability for the site’s conservation objectives to be met is considered below.

Qualifying habitats affected

The following locations in which exceedances have been predicted were not screened out on the basis of proximity to the road or absence of qualifying features:

⁴ DMRB Volume 11 Section 3 Air Quality, 2007

- B172 between Epping Rd & Forest Rd; north & south side (two transects): The two transect exceedances on the north side were found not to support SAC qualifying features during the 2024 site survey visits. The South side 40m Ndep and NH₃ in-combination exceedances impact an area that partially supports SAC qualifying features (area immediately adjacent to road comprises beech woodland with young and semi-mature trees and a sparse holly understory).
- A104 / A503 / A406 jcn: Qualifying habitat present within the 30m from centre of the road affected by NO_x, confirmed through site visit: mature broadleaved woodland incorporating veterans and pollards with holly understory.

Ability to meet Conservation Objectives

Critical Loads are defined by United Nations Economic Commission for Europe (UNECE⁵) as “a quantitative estimate of exposure ... below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge”.

The critical loads data on which exceedance calculations are based are derived from empirical or steady-state mass balance methods, which are used to define critical loads for the long term. Exceedance of critical loads is an indication that an ecosystem is at risk from potential harmful effects in the long-term. Therefore, exceedance is not a quantitative estimate of damage to the environment; it does not necessarily mean that harmful or adverse effects have already occurred or may be observed, but that there is a risk of damage in the long-term.

The affected SSSI units condition surveys (last surveyed in 2010) all refer to veteran trees showing signs of stress from acidity and nitrogen deposition. However, source attribution data from APIS shows that, between 2012-2018 (the years for which the data is available), the contribution of vehicle emissions to air pollution at Epping Forest SAC has almost halved (c.3.4KgN/ha/yr to c.2.0KgN/ha/yr); with 10.1% of the Nitrogen emissions originating from road transport (10.8% of local contributions and 8.6% of long range contributions). Contributions from other long range sources have also fallen. During the same period, the % contributions from other local sources such as non-agricultural waste (16.3%), livestock (12.1%) and fertiliser application (5.6%) have continued to rise.

The Critical Loads for the qualifying habitats (beech woodlands) affected by predicted exceedances are 10-15kgN/ha/yr for nitrogen deposition, 1 or 3µg/m³ for ammonia, and 30 µg/m³ for NO_x. Looking at the 1km APIS data for 2010 to 2021 ('site detailed grid information'), local levels for the relevant pollutants at the three affected locations are:

- B172 between Epping Rd & Forest Rd: N dep has fallen from a grid average of 16.1 to 13.7 (i.e. to below max Critical Load), but deposition to 'forest' has fallen from 31.5 to 25.9 (still well above CL). NO_x has fallen from 28.6 to 16.8 (both levels below CL).
- A104 / A503 / A406 jcn: NO_x has fallen from 56.7 to 34.4 (both levels above CL).

Meeting the conservation objective target to restore pollutant concentrations, in relation to these locations specifically, therefore requires a reduction in nitrogen deposition (B172) and NO_x (A104/A503/A406). The trends visible on the APIS data indicated that there are falling pollutant levels at all three locations, likely to be related to the reduction in the % contributions from traffic and long range sources. Enfield's contribution to the in-combination exceedance (i.e. the 'alone' exceedance) will not have an adverse effect on the integrity of the SAC, and contributions from other local authority areas will be subject to mitigation (see below). We therefore consider that it is unlikely that the localised increases in pollutants at these locations would prevent the SAC's overall 'restore' objectives for air quality from being met.

Mitigation provided by Epping Forest District Council

In relation to air quality impacts on the SAC, Epping Forest District Council (EFDC) has produced its own Interim Air Pollution Mitigation Strategy⁶. The aim of the Interim Strategy is ‘... to provide a strategic approach to mitigating the effects of development on the integrity of the Epping Forest SAC in relation to atmospheric pollution’. In para 3.5 this Interim Strategy states:

⁵ <http://www.unece.org/env/lrtap/WorkingGroups/wge/definitions.htm>

⁶ 'Epping Forest Interim Air Pollution Mitigation Strategy: Managing the Effects of Air Pollution on the Epping Forest Special Area of Conservation Dec 2020

“The outputs of modelling undertaken showed that growth in Epping Forest District up to 2033 (i.e. the end of the Local Plan period) is the primary source of additional ammonia and NOx emissions on the modelled road sections and all other plans and projects would appear to make a negligible contribution to the ‘in combination’ effect. This is thought to be because the average daily traffic flow on all the modelled sections of road is dominated by people who either live or work in Epping Forest District, particularly the settlements that surround the Epping Forest SAC, including Epping itself”.

The EFDC Interim Strategy includes a number of policies and measures aimed to mitigate for this in-combination air quality impact on the SAC.

The Air Pollution Mitigation Strategy and the Local Plan HRA were the subject of much discussion during the Local Plan Examination. The Inspector suggested changes to EFDC Local Plan policy DM2 and concluded:

“That is all that is required for Part B of the policy to be sound and fully effective and for the local plan to safeguard impacts on the SACs

The reference to the Council’s mitigation strategies for the Epping Forest SAC should be put into the supporting text in brief. They are not examined documents and cannot form part of local plan policy. In any case it is noted that the air quality mitigation strategy is not finalised; certain aspects such as the CAZ have not been fully worked through, and consultation and technical modelling are likely to be required, notably involving Essex County Council who are currently an objector to that aspect of the air quality strategy. Moreover, this is a fast moving subject, with ongoing rapid take up of fully electric vehicles in response to technical improvements, increasing fuel costs and changing social attitudes: see <https://www.gov.uk/government/statistics/vehicle-licensingstatistics-2021/vehicle-licensing-statistics-2021> There was a 76% annual increase in battery electric vehicle registrations in 2021 and a 1,726% increase in such registrations over the 5 years to 2021. Additional statistics for Q1 of 2022 will be available in July 2022 but the trend is expected to continue on a rapid upward trajectory.”

Subsequently, the EFDC Local Plan HRA was amended in October 2022⁷ and concluded:

“(Para 6.64)...it is considered that, provided a CAZ is introduced from 2025, based on the current modelling outputs⁸², the identified Council initiatives to shift ownership of petrol cars to electric vehicles are introduced from plan adoption and can achieve a 30% conversion of petrol cars to ULEVs by 2033, and the additional measures (such as a right turn ban at Honey Lane and veteran tree management plans) are included in the APMS, the integrity of the SAC would not be adversely affected by nitrogen deposition attributable to planned growth in the district to 2033 and would generally be positively affected by the planned mitigation measures, in terms of enabling the SAC to meet its conservation objectives.

Significantly, given the Local Plan assessment year of 2033, UK government policy is for 100% of new cars and vans registered in the UK to be a ULEV (i.e. electric vehicle or similar e.g. hydrogen) by 2030, although it is not currently included in the EFT projections. This is to be achieved by a total ban on the sale of new petrol and diesel cars and vans from that year. Therefore, a rapid acceleration in uptake in ULEVs can be expected over the plan period (particularly in the last 5-year period), and it is thus entirely possible that something approaching a 30% shift from petrol cars to ULEVs by 2033 could be achieved even without specific steps being taken by EFDC. For example, global electric car sales rose 43% in 2020 due to a considerable reduction in battery costs, and further falls in battery prices are predicted to bring the price of electric cars below that of equivalent petrol and diesel models, even without subsidies, by approximately 2025. It is also important to note that the 30% shift from petrol to electric cars is calculated based upon vehicle trips through EFSAC as opposed to the number of vehicles on the road. It therefore follows that a change of one petrol car to electric would have a disproportionate impact if it makes several journeys through forest. 6.73 However, passively relying on car owner reactions to government policy would not provide sufficient likelihood that the target 30% conversion of petrol cars to ULEVs would occur by 2033. Therefore, specific initiatives that are within the control of EFDC and designed to stimulate and encourage the replacement of petrol cars with electric vehicles are required.

With that in mind EFDC need to have the following operating to enable a conclusion of no adverse effects on integrity:

⁷ EFDC Local Plan 2022 HRA, Aecom Oct 2022

1) Minimising the increase in traffic flows through the SAC as much as possible, by strongly limiting parking availability in sustainable locations, encouraging ULEV-only⁸⁸ parking spaces where these are enforceable and introducing controlled parking zones to discourage on-street parking.

2) Introducing initiatives to support walking, cycling and increased public transport use and ensuring these are included in planning consents where possible and appropriate.

3) Introducing a series of initiatives that are directly intended to stimulate uptake of ULEVs to maximise the likelihood of achieving the conversion of 30% of petrol cars using the modelled roads to ULEVs by 2033 (beyond those that can be built into the CAZ as discussed above). These essentially involve: a) Awareness Raising Campaigns to promote the benefits of electric vehicles, the availability of charging infrastructure, and falling electric vehicle prices due to falling battery costs, to residents of Epping Forest District and particularly those who live in settlements surrounding the SAC; b) Ensuring that electric vehicle charging infrastructure is universally available in public and private parking spaces and that a significant proportion of new parking spaces have active EV charging provision (particularly rapid charging provision); and c) Positively incentivising the uptake of electric vehicles by (for example) introducing schemes to directly assist with ULEV purchase, adjusting the charging framework of any CAZ such that drivers of electric vehicles pay little to no tariff and providing electric vehicle owners with benefits such as free parking.

4) Introducing a Clean Air Zone covering the SAC from 2025. At its simplest this would involve charging people driving into the zone for doing so, every time they do so, based upon the age and type of their vehicle. The aim would be to encourage motorists to replace older vehicles compliant with outdated emissions standards with newer vehicles compliant with the latest emissions standards, particularly Ultra-Low Emission Vehicles or ULEVs, through a graduated charging system (for example, zero charge for ULEV owners, or an increased charge for petrol car owners). It would potentially also encourage those motorists who were able to utilise other routes to use those instead of the roads through the SAC. As a precaution no dynamic reassignment has actually been assumed in our modelling; however, it could be built into the CAZ as a deliberate objective of the charging strategy

“Epping Forest Air Pollution Mitigation Strategy (APMS) – The APMS includes a number of specific measures and how they would be delivered to ensure that there would be no adverse effect on the integrity of the Epping Forest SAC in relation to atmospheric pollution. This reflects the findings of the HRA 2022 that new development within the District has the potential to increase pollutants of concern within the Epping Forest SAC, primarily arising from emissions of nitrogen dioxide and ammonia from additional vehicles using roads in close proximity to it. The APMS has taken account of the need for development proposals to be assessed both alone and in combination with other plans and projects and therefore provides a strategic approach to the identification and delivery of mitigation and monitoring measures. These measures range from those which will help to limit the increase in the level of traffic using roads through the Epping Forest SAC and significantly increase the uptake of electric vehicles, through to the implementation of a ‘Clean Air Zone’ should the future monitoring demonstrate that it is required. (an associated Footnote provides clarification as follows: The APMS also includes targets against which progress will be assessed together with a Monitoring Framework, which includes for future on-site monitoring. This Monitoring Framework is necessary to ensure that progress towards the achievement of these targets is assessed and informs any necessary changes that may need to be made to the targets and measures and identified in the APMS.”

Therefore, it is concluded that in line with evidence contained in the EFDC Interim Strategy, Local Plan and Local Plan HRA, that:

- Growth in Epping Forest District is the primary source of air pollution from traffic growth affecting the SAC; and
- Mitigation measures adopted by EFDC in the Interim Strategy and policies in the EFDC Local Plan will result in no significant effect on the integrity of the SAC.

LB Enfield’s own sustainable transport policies will also contribute to a reduce in air quality impacts on the SAC as stated in the Enfield Local Plan Integrated Impact Assessment⁸:

“Policies SP T1: Promoting sustainable transport and DM T2: Making active travel the natural choice are expected to have significant positive effects in relation to IIA11: Air pollution and IIA12: Sustainable transport because they encourage walking and cycling, in addition to public transport, over use of the private car through upgrades to the public transport system. As a

⁸ Enfield Council: Enfield Local Plan Integrated Impact assessment, LUC June 2021

result, this is likely to help minimise air pollution. In particular, Policy SP T1 will improve sustainable transport throughout the Borough and to other parts of London and beyond, including Hertfordshire and Essex, in line with the objectives of the Mayor's transport Strategy and Enfield Transport Plan."

Given this evidence, and the fact that Enfield Local Plan will not have a significant impact on the SAC alone in relation to air quality, it is considered that in-combination effects from the Enfield Local Plan are not significant and assuming that mitigation measures introduced by EFDC are fully implemented, there will be no in-combination effect on the SAC.

Conclusion

In terms of the Enfield Local Plan 'alone', there are a small number of air quality exceedances (Ndep and NH₃) of 10-20m, impacting 0.01% of the SAC. Impacts to this distance from the road are not considered significant as there are degraded, or no, qualifying habitats present in these roadside locations.

There are a number of in-combination exceedances for Ndep, NO_x and NH₃. Many of these are screened out due to distance (up to 20m), likelihood that habitats are degraded by proximity to the road, or a lack of SAC features being present. In a small number of locations (B172 Epping Forest Road to Forest Road South Side; A104/A503/A406 junction south side), exceedances are between 30m and 50m and SAC features are present. However, whilst Enfield has a contribution to these exceedances, LB Enfield's contribution to these in-combination exceedance is not considered significant (i.e. its impacts alone will not have an adverse effect on the integrity of the SAC); and taking into account the mitigation proposed by Epping Forest Council it is considered that in-combination effects from sources other than Enfield are mitigated.

It is therefore considered that alone and in-combination effects from the Enfield Local Plan are not significant and assuming that mitigation measures introduced by EFDC are fully implemented, there will be no in-combination effect on the SAC.

Appendix: Site visit results




Survey locations were those predicted to exceed AQ screening thresholds for acid deposition, as these were the locations that could not previously be screened out by desk study. Note that the updated traffic modelling means that some locations that were surveyed now no longer exceed the screening criteria.




The qualifying features susceptible to air quality changes and considered as part of the Site inspections include:

- Atlantic acidophilous beech forests with Ilex and sometimes also *Taxus* in the shrub layer.
- Northern Atlantic wet heaths with *Erica tetralix*
- European dry heaths




Table 1.3. Site inspection notes

Transect reference	SAC Qualifying Habitat Present?	Photographs
<p>O: A121 near Woodgreen Rd jcn</p>	<p>No. Transect area comprises car park, amenity grassland and broadleaved woodland.</p> <p>The broadleaved woodland is dominated by oak and hawthorn and lacks the qualifying features associated with the SAC.</p>	

		
<p>E2: A121 between Epping Rd and Woodredon Farm Ln; north side</p>	<p>Partially. No veteran trees or pollards present but young beech trees present and understorey of holly.</p>	
<p>E1: A121 between Epping Rd and Woodredon Farm Ln; south side</p>	<p>Partially. No veteran trees or pollards present but young beech trees present and understorey of holly.</p>	

<p>B1: B172 west of A104 / A121 jcn (south side)</p>	<p>Partially. Area immediately adjacent to road comprises beech woodland with young and semi-mature trees and a sparse holly understory.</p>	
<p>B2: B172 west of A104 / A121 jcn (north side) B172 between Epping Rd & Forest Rd; north side (two transects). Screened out as no SAC qualifying features.</p>	<p>No. Area dominated by bracken with regenerated silver birch and oak woodland and hawthorn and gorse scrub.</p>	
	<p>No. Area dominated by bracken with regenerated silver birch and oak woodland and hawthorn and gorse scrub.</p>	

<p>ECO24: A110 between Brook Road and Forest Side (north); and ECO27: A110 at Brook Rd jcn</p> <p>Screened out as no qualifying features present.</p>	<p>No. Area comprised of grasslands.</p>	
<p>ECO25: A110 between Brook Road and Forest Side (south; no exceedances in these locations with updated model); and ECO26: A110 at Brook Rd jcn</p>	<p>Partially – mature broadleaved woodland but oak dominated with absence of veterans and pollards. Holly abundant in shrub layer.</p>	

		 
<p>ECO36, A104 nr A406 jcn ECO37 & ECO38, A104/A406 roundabout; and ECO39 A406 nr A104 jcn (north) (No exceedances in these locations with updated model.)</p>	<p>Yes. Mature broadleaved woodland incorporating veterans and pollards with holly understory.</p>	



		
<p>ECO42, ECO43, ECO44: A104 / A503 / A406 jcn</p>	<p>Yes. Mature broadleaved woodland incorporating veterans and pollards with holly understory.</p>	