JNCC Report
No. 696

Main Report

Guidance on Decision-making Thresholds for Air Pollution

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December 2021

ISSN 0963 8091

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This report should be cited as:
CHAPMAN, C. & KITE, B. 2021. *Guidance on Decision-Making Thresholds for Air Pollution*. *JNCC Report No.696 (Main Report)*, JNCC, Peterborough, ISSN 0963-8091.

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Scientific advisers from Natural Resources Wales, Environment Agency (England), Natural England and Northern Ireland Environment Agency peer reviewed the work. Contractors made changes accordingly and the updated reports were approved by the reviewers and the Inter-agency Air Pollution Group before being finalised. Full details are available upon request.

Acknowledgments:
This report is written by DTA Ecology with contributions from Ecological Planning and Research Ltd. The authors would like to acknowledge the contributions made by Air Quality Consultants to the underpinning air quality modelling and evidence base. Sincere thanks to key external stakeholders who participated in the Ecology Workshops held on 23rd and 26th November 2020, including:

UK Centre for Ecology and Hydrology
Natural Resources Wales
Natural England
NatureScot
Environment Agency
Northern Ireland Environment Agency
Scottish Environment Protection Agency
Baker Consultants
AECOM
Manchester Metropolitan University
University of Lancaster
Plant Life
BSG Ecology
Fleming Ecology
Corporation of London
Shropshire Council

Executive Summary

This report provides decision-making criteria to inform the assessment of air quality impacts on designated conservation sites. The criteria are intended to be applied to individual sources to identify those for which a decision can be taken without the need for further assessment effort. For the purpose of decision-making further assessment effort is reasonably required where it might

i. enable a decision-maker to move closer to reaching a decision;

ii. influence the decision to be taken; or

iii. be relevant to conditions or restrictions subject to which consent may be given.

Contributions from individual sources which are below a relevant threshold can properly be ignored on the basis that their combined effect will not undermine the achievement of the conservation objectives or make a meaningful contribution to a significant effect. **In the context of decision-making a 'meaningful contribution' is one whereby further assessment might reasonably influence the outcome of the decision to be taken**.

In accordance with relevant court decisions, the decision-making criteria have been derived through an assessment in advance which, in practice, considers the cumulative effects of plans and projects which might be excluded from further assessment through the application of the criteria. The thresholds referred to in this report can therefore be explained on logical and empirical grounds. This report should be read alongside the supporting Technical Report which provides the detail concerning the underpinning technical assessment and modelling work from which the thresholds have been derived.

The underpinning rationale which underpins the criteria for non-road sources can be summarised as follows:

1. A level of environmental change, over a defined timeframe, which will not undermine the achievement of the conservation objectives for air quality is identified. This is referred to as 'Objective Compliant Change' (OCC).
2. Assuming a worst-case scenario in terms of the rate at which plans and projects might come forward (i.e. high development pressure) a decision making threshold (DMT) is calculated. The DMT is the maximum contribution from an individual plan or project such that the combined effects of proposals below the threshold will not exceed the OCC value. The plans and projects can properly be ignored as their combined effects will not undermine the achievement of the conservation objectives.
3. Having established a relationship between how the spatial distribution and frequency of individual plans and projects can act in a cumulative manner, it is then possible to derive site-relevant thresholds (SRTs) which can be applied to sites where development pressure (i.e., the rate at which plans and projects are anticipated to come forward) is lower.

The criteria for roads are different. They are derived on the basis of the degree to which a new project contributes to the forecast increase in traffic on the road concerned. Where development pressure is high (on the basis of the predicted annual traffic increase) a small project-specific increment is applied. Where development pressure is lower a larger project-specific increment can be accepted. Road-relevant refinements to the proposed criteria can be applied which take account of the distance between the road and the nearest boundary of a designated site.

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1 Introduction

1.1 Why read this guidance?

This report has been commissioned by the JNCC (Joint Nature Conservation Committee[1]) on behalf of the Inter-agency Air Pollution Group[2] and Defra (Department for Environment, Food and Rural Affairs). It provides an evidentiary basis for decision-making thresholds (DMTs) to inform the assessment of air quality impacts on designated sites. DMTs can be applied to individual proposals to determine whether an assessment in combination with other plans and projects is required, or, whether the risk from air pollution related impacts is sufficiently small that no further assessment effort is necessary. Contributions from individual sources below the DMT can properly be ignored on the basis that their combined effect will not undermine a site's conservation objectives.

Readers wanting to scrutinise the underlying technical evidence basis for the approach set out in this report are referred to a supporting Technical Report produced by Air Quality Consultants[3] (hereafter referred to as 'the Technical Report'). This guidance does not reiterate or duplicate the content presented in the more detailed technical report. A full understanding of the approach to be taken, and the underpinning evidence base, is provided by both reports, read together.

1.2 Who is this guidance for?

This report is intended for an 'end user' who is involved in the assessment of air pollution impacts on designated sites to inform decision-making. It is drafted for use by nature conservation body advisers, but the thresholds set out in this report could equally be used by competent authorities as well as consultants acting on behalf of project proposers. JNCC does not prescribe a specific approach to be followed but the approach provided in this guidance can be applied by decision-makers at their own discretion.

1.3 Structure of the guidance

The guidance provided in this document is divided into five sections and four supporting appendices as follows. The report introduces the thresholds, and how they are relevant to decision-making with reference to supporting case law in sections 1 and 2. Sections 3 and 4 contain the thresholds to be applied for on-site emission sources and section 5 sets out the approach to thresholds for road-based emission sources.

1.4 When should it be used?

This report should be used to inform decision-making where a proposal gives rise to the potential for air pollution impacts on designated nature conservation sites. The thresholds provided in this report are relevant to the early stage in decision-making which concerns the potential risk from a given proposal, and the extent to which further assessment effort is required before a decision can be taken. In the case of a designated European site, a threshold can be applied to inform initial considerations under the first stage of a Habitats Regulations Assessment (HRA) which asks whether there will be a likely significant effect, either alone or in combination with other plans and projects. In the case of an assessment for a SSSI or ASSI (NI) a threshold can be applied as a preliminary step to inform a decision

[1] *De minimis* and air pollution thresholds – contract reference C20-0440-1475

[2] https://jncc.gov.uk/our-work/inter-agency-air-pollution-group-iapg/

[3] JNCC Report No 696 Technical Report - Decision-making Thresholds for Air Pollution https://hub.jncc.gov.uk/assets/6cce4f2e-e481-4ec2-b369-2b4026c88447

over the need for further assessment effort to determine whether a proposal is likely to damage the site in question.

This report is intended to be relevant to the preliminary steps in a decision-making process. **The exceedance of a threshold is not decisive in and of itself**, nor does it suggest that damage is likely to occur (in the case of A/SSSI) or that it will not be possible to avoid adverse effects to site integrity (in the case of a European site). The exceedance of a threshold merely indicates a need for further assessment effort, in combination with other plans and projects before a decision can be reached. No guidance is provided in respect of subsequent assessment stages. Where the proposed thresholds are exceeded the following sources of information are relevant.

- Advisory Note: Ecological Assessment of Air Quality Impacts (CIEEM, Jan 2021)
- Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (refer section 5 'Advising competent authorities on the scope and content of an appropriate assessment').

1.5 Some definitions

Terminology around the concept of thresholds or criteria which might be applied to inform decision-making is often confused. Terms have been widely used to mean different things in different contexts. To avoid confusion, the following definitions apply to this report and each is further explained below.

Table1.1: Definitions of key terms used within this report.

Term	Definition
De minimis	A concept which refers to an overall quantum of change (however it arises) that is of no consequence, irrespective of other considerations.
Objective Compliant Change (OCC)	A quantified magnitude of change, across a defined period of time, which will not undermine the achievement of the conservation objectives for a designated site.
Decision-making Threshold (DMT)	A quantifiable contribution from an individual source, below which associated effects can properly be ignored for the purpose of decision-making. The cumulative effects of proposals excluded by it will not undermine the achievement of the conservation objectives. Further assessment would not change the outcome of the decision to be taken.
Site-relevant Threshold (SRT)	Taking account of *site-specific considerations*, a quantifiable contribution from an individual source, below which associated effects can properly be ignored for the purpose of decision-making. The cumulative effects of proposals excluded by it will not undermine the achievement of the conservation objectives *for the site concerned*.
Assessment in advance	An assessment carried out in advance for the purpose of: i) examining the cumulative effects of nitrogen deposition on designated sites, and ii) determining decision-making thresholds.

Term	Definition
Assessment of Cumulative Effects	An assessment of the cumulative effects of nitrogen emissions resulting from anticipated future plans and projects over a defined time period for the purpose of carrying out an Assessment in Advance.
In-Combination Assessment	A formal assessment of the effects of 'other plans and projects' which are relevant at the point at which a specific plan or project is subject to assessment.

For the purpose of this report **'*De minimis*'** is a concept which refers to an overall magnitude of change (however it may arise) which is of no consequence. A *de minimis* effect can properly be described as 'inconsequential', 'nugatory' or 'trivial'. All such terms are synonymous and are used to describe contributions which can properly be ignored, irrespective of other considerations. *De minimis* cannot helpfully be defined in a quantitative manner, for purposes of decision-making, as it is a *concept* based on professional judgment and common sense in light of the specific circumstances which apply in any given scenario. In a legal sense Reuters states that '*De Minimis* is:

> *"A legal term meaning too small to be meaningful or taken into consideration; immaterial. As a matter of policy, the law does not encourage parties to bring legal actions for technical breaches of rules or agreements where the impact of the breach is negligible. The term* de minimis *is taken from a longer Latin phrase which translates into "the law does not concern itself with trifles".'*

Conservation objectives are central to the protection of designated sites. **Objective Compliant Change (OCC)** is a quantified level of predicted change, across a defined period of time, which is considered to be compliant with the conservation objectives (hence **objective** compliant change). The derivation of an OCC value takes account of the ecological implications of change, over time. An OCC could also be described as a predicted change, over time, which will not undermine the achievement of the conservation objectives. OCC differs from *de minimis* in that it is quantifiable and may reasonably be reviewed in circumstances which are relevant to the ecological implications of change. Further information concerning OCC can be found in Appendix 1 of this report and section 2 of the Technical Report.

Once an OCC has been defined, air quality modelling tools can be used to undertake an assessment of the cumulative effects of proposals which might come forward over time. The modelling work can consider numerous spatial distributions of plans and projects, and how they might interact with each other. A **decision-making threshold (DMT)** is a contribution from an individual emission source (the process contribution) below which associated effects can properly be ignored on the basis that the cumulative effects of proposals below a DMT will not exceed the OCC. It is procedurally attractive to have a universal DMT which can be applied to all decisions, without the need to take account of site-specific considerations. DMTs are therefore derived on a precautionary basis, for a 'worst-case scenario' with regards the rate at which plans and projects might come forward over time. Further information concerning the derivation of DMTs can be found in Appendix 2 of this report and section 5.5 of the Technical Report.

DMTs derived on a worst-case scenario will be overly precautionary when applied to a site which is inherently less sensitive to air quality, or subject to lower levels of development pressure. Conservation objectives are site-specific, and a *site-relevant threshold (SRT)* can therefore be derived on a site-by-site basis taking account of the characteristics and specific

environmental conditions at a site concerned. Site-relevant threshold might take account of the likelihood of similar proposals coming forward, emissions types, background trends, source attribution data and the local circumstances which apply at a given site.

2 The use of thresholds in decision-making

2.1 Air quality assessment as part of a decision-making process

An assessment of air quality impacts can be necessary under various decision-making processes. The primary purpose of the assessment under such circumstances is to inform a decision which needs to be taken as to whether a consent, permission or other authorisation should be granted, or not. **All proposed thresholds within this report are described and applied within the context of decision-making**.

Decision-making is informed by best available scientific information. In some cases, the available science provides a decision maker with clear and precise information capable of removing any doubt as to the consequences of a proposed activity. In other areas the available science is subject to limitations meaning that decision makers must use their professional judgement and consider the available evidence in light of the decision-making framework, and specific legal tests, which apply.

Decisions are therefore constrained by the evidence which is available at the time a decision is taken. The extent to which uncertainty in the evidence base influences decision-making will depend upon the underpinning legislative framework. The most precautionary approach to decision-making for designated sites is required under the Habitats Regulations where it is established case law that:

- In screening for likely significant effects, an effect is 'likely' if it cannot be excluded on the basis of objective information. An effect is 'significant' if it undermines the conservation objectives.[4]
- In applying the integrity test (after an appropriate assessment), decision makers must be satisfied that no reasonable scientific doubt remains as to the absence of adverse effects to site integrity[5].

Whilst decision-makers have more discretion with decisions affecting A/SSSIs, a precautionary approach is still appropriate in early assessment stages to ensure that any relevant proposals are progressed for more detailed consideration.

2.2 A *reasonable* approach to air quality assessment and in-combination

Whilst a precautionary approach may be required to an assessment of air pollution effects, no legislative framework requires the exclusion of all doubt. The Habitats Regulations requires the exclusion of *reasonable scientific* doubt. Doubt which is *un*scientific or *un*reasonable need not constrain decision-making. The Courts have also recognised that there is no such thing as absolute certainty. Instead, decision makers need to identify *reasonably* foreseeable risks, on the basis of information that can *reasonably* be obtained and put in place a legally enforceable framework with a view to preventing those risks from materialising[6]. Furthermore, the Courts have also established that, whilst a risk is sufficient to constrain development under the Habitats Regulations, there must be credible evidence that there is a real, rather than a purely hypothetical, risk which must be considered[7].

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[4] CJEU Case C-127/02 (The Waddenzee Ruling) refer paragraphs 45 & 47
[5] CJEU Case C-127/02 (The Waddenzee Ruling) refer paragraph 59
[6] World Wild Life Fund & Ors, Re Application for Judicial Review, 27th October, [1998] ScotCS 38.
[7] Boggis v Natural England and Waveney DC [2009] EWCA Civ 1061

Where an assessment is required in respect of a designated site the applicant is expected to provide such information as the decision maker '*may reasonably require'* for the purposes of the assessment[8]. **Any requests for information to inform a decision-making process must therefore be reasonable.** Government guidance on Habitats Regulations identified 'HRA principles', one such principle is that a decision maker should *'ask for information from the proposer that's proportionate, for example only ask for information or evidence you need to meet the regulations'*[9]. For the purpose of decision-making, evidence is reasonably required where it might

i. enable a decision-maker to move closer to reaching a decision;

ii. influence the decision to be taken; or

iii. be relevant to conditions or restrictions subject to which consent may be given.

This guidance is relevant to decision-making where an individual proposal is subject to consideration, either alone or in combination with other plans and projects. The phrasing '*either alone or in combination'* is directly relevant to an assessment under the Habitats Regulations, but assessments in respect of SSSIs will also need to take account of cumulative impacts. The thresholds proposed in this report can therefore be applied to inform decision-making for both European sites and SSSIs.

A request for information to undertake an in-combination assessment where there is no prospect that further assessment effort would ever influence the outcome of the decision to be taken, may therefore be regarded as *un*reasonable. Decision-makers must interpret and apply the in-combination provisions in a proportionate manner, exercising their professional judgement as to when an in-combination and/or cumulative assessment is necessary.

2.3 The case law

A more detailed analysis of various case law decisions which are relevant to the use of thresholds, and the approach to be taken to the in-combination requirements under the Habitats Regulations, are found in Appendix 3. A summary of the key extracts and associated implications is provided in table 2.2 below. Cases are referred to in chronological order.

[8] Refer regulation 63(2) of the Habitats Regulations
[9] Refer https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

Table 2.2: Summary of relevant court decisions and implications.

Court decision	Court extract and implications
European Commission Parliamentary Question (2005)	In response to a question concerning the interpretation of EC guidance and the scope of the in-combination requirements. *'*[the scope of an assessment in combination] *needs to take account of particular circumstances of specific cases as well as the practical feasibility of making an assessment of combined effects… The combination provision must be applied in a manner that is proportionate to the timing, planning stage and the legality of the proposed plans and projects.'* **Implications: An in-combination assessment must be practically feasible and the in-combination provisions must be interpreted and applied in a proportionate manner.**
Walton [2011] CSOH 131	In response to an argument that the decision was flawed as it had failed to properly assess its effects in-combination. '*The* [decision makers] *were entitled to exercise judgement as to the projects with whose effect the proposal had to be considered in-combination… As regards the in-combination point… I agree that there must be a degree of flexibility in assessing the projects with which a particular proposal should be regarded as having an in-combination effect.* **Implications: a decision maker is entitled to exercise judgment over which other plans and projects to take into account and there must be a degree of flexibility to an in-combination assessment.**
Sweetman (AG Opinion) Case C-258/11 (2012)	A challenge concerning small scale effects and the concept of *de minimis*. *'48. The requirement that the effect in question be 'significant' exists in order to lay down a* de minimis *threshold. Plans or projects that have no appreciable effect on the site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill.'* **Implications: The need to avoid legislative overkill is of central importance in considering how the Directive is to be interpreted and applied. Proposals with no appreciable effect are excluded from further assessment.**

Court decision	Court extract and implications
Newry [2015] NIQB 65	In response to a challenge against grant of planning permission and a failure to undertake in combination assessment of effects on an SPA 18km downstream. *'Any impacts… will be negated as a result of tidal nature of Carlingford Lough* (the associated mixing) *and distance* (dilution factors)*… The development will not therefore contribute to any in-combination effects with other developments, including the particular developments relied upon by the Applicant… These are matters of expert judgment which cannot legitimately be condemned as unreasonable… The decision maker was entitled in the circumstances to accept and act upon the independent expert view of the statutory consultee.'* **Implications - It is possible to eliminate the need to undertake an in-combination assessment on the basis of professional judgment, having regard to advice from the statutory nature conservation body.**
Wealden DC v SoS and Lewes DC (2017) EWHC 351 (Admin)	A challenge concerning the use of a threshold-based approach to avoid the need to consider in-combination effects in the context of air quality impacts from traffic. Addressing the point at issue in a general sense (refer paragraph 95): '*If it is known that specific impacts are very low indeed, or are likely to be such, these can properly be ignored.'* In response to the specific circumstances of the case: *'In my view, it was not apparent why Natural England was advising that a cumulative assessment did not require an aggregation of two figures… Natural England's advice cannot be supported on logical and empirical grounds… I believe that Natural England's advice, brief as it was, cried out for further explanation… To all intents and purposes, therefore, Natural England's advice removed the premise of the HRA – that a cumulative assessment is required – and brought about a clear breach of Article 6(3) of the Habitats Directive.'* **Implications - the use of thresholds is acceptable in principle as impacts which are very low indeed can properly be ignored. However proposed threshold-based approaches should be supported on logical and empirical grounds.**

Court decision	Court extract and implications
Dutch Nitrogen Ruling Cases C-293/17 and C-294/17 (2018)	In circumstances where the conservation status is unfavourable… *'the possibility of authorising activities which may subsequently affect the ecological situation of the sites concerned seems necessarily limited'.* In responding to a question which asks whether the Habitats Directive precludes the use of thresholds in respect of nitrogen deposition where such thresholds have the effect of exempting proposals from further assessment. '*The Habitats Directive must be interpreted as not precluding…. exempting certain projects which do not exceed a certain threshold value or a certain limit value in terms of nitrogen deposition from the requirement for individual approval if the national court is satisfied that the 'appropriate assessment'… carried out in advance, meets the criterion that there is no reasonable scientific doubt as to the lack of adverse effects of those plans and projects on the integrity of the sites concerned.'* **Implications: The permitting of additional pollution loading where a natural habitat is in unfavourable conservation status is necessarily limited. However, the Directive does not preclude the exemption of projects which do not exceed a certain threshold or limit value from further assessment. Any such threshold must be justified on the basis of an 'appropriate assessment' carried out in advance to demonstrate that the plans and projects which might be so exempted will have no adverse effect on the integrity of the sites concerned.**

2.4 Applying the thresholds

The thresholds to be applied are described in sections 3, 4 and 5 below, with accompanying explanation provided within the Technical Report. The thresholds create a presumption in favour of approval unless any of the exceptions referred to in section 3.2 apply. The application of the thresholds to inform decision making, and the need for further assessment effort, is summarised in Figure 2.1 overleaf.

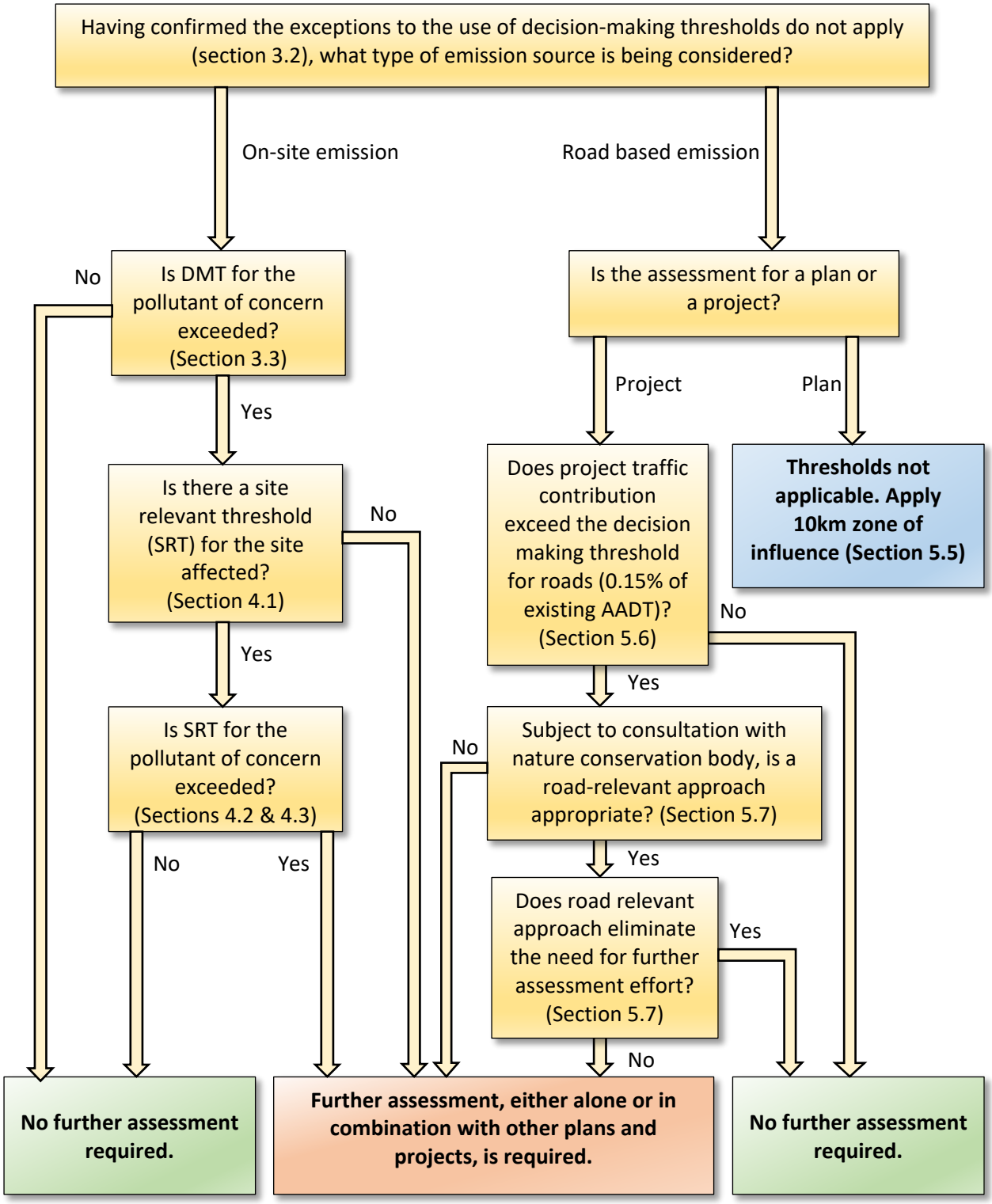

Figure 2.1: Flowchart to illustrate how the thresholds inform decision-making and the need for further assessment effort.

3 The decision-making thresholds

3.1 What is a decision-making threshold?

A decision-making threshold (DMT) is a quantifiable contribution from an individual emission source, below which associated effects can properly be ignored, either alone or in combination. This is on the basis that the cumulative effects of proposals below a DMT will not undermine the conservation objectives or make a meaningful contribution to a significant effect. **In the context of decision-making a 'meaningful contribution' is one whereby further assessment might reasonably change the outcome of the decision to be taken or otherwise influence the imposition of conditions or restrictions subject to which consent might be granted**.

A DMT has been derived as part of this project through an assessment, carried out in advance, which has modelled various permutations of the combined effects of numerous individual proposals which might be excluded from the need for further assessment. Further details regarding the modelling work can be found in the Technical Report.

When considering whether a proposal has a 'likely significant effect' it is established case law that an effect is only 'significant' in this context if it undermines the conservation objectives. The modelling work which underpins the DMT provides an evidence basis which can be relied upon to be satisfied that the cumulative effects of plans and projects which are excluded from further assessment will not exceed the OCC value (refer Appendix 1 of this report and section 2 of the Technical Report), and hence will not undermine the achievement of the conservation objectives.

3.2 Exceptions[10]

The mechanisms through which air pollution can affect habitats and species are complex. Some qualifying features are particularly sensitive to air pollution such that adverse effects manifest rapidly and are not readily reversible. In other cases, the specific environmental conditions at a particular site may render it more sensitive to small additional increases in pollution.

Table 3.1 below sets out the scenarios where the application of the DMTs listed at 3.4 and/or the site-relevant thresholds referred to in section 4 would not be appropriate. Where an exception scenario applies a more detailed assessment should be undertaken.

Where reference is made in table 3.1 to species which 'form an important part of a qualifying feature', this should be determined with reference to:

- The Natura 2000 Data Form or citation, interpreted with reference to the Interpretation Manual of European Habitats (EUR-28)(2013) which may contain references to important components to habitat types (e.g. species sensitive to air pollution impacts);
- The Conservation Objectives for the site and supporting Supplementary Advice;
- A/SSSI citation document.

[10] Section 3.2 and the supporting Appendix 5 have been drafted by Ecological Planning & Research Ltd.

Table 3.1: Exception scenarios where DMTs and site-relevant thresholds do not apply.

Scenario	Justification
1. 'Clean' or 'pristine' sites (i.e., those with very low existing levels of air pollution) where there is reason to doubt the improving background trend.	Evidence suggests that in very clean sites, hyper-sensitive species can be lost even at deposition rates below the established Critical Load/Level for the wider habitat type.
2. Sites with sensitive epiphytic or epilithic components that are, or form an important part of, a qualifying feature of the site and which are at or just below their Critical Load/Level.	Epiphytic (growing on the surface of another plant) or epilithic (growing on the surface of stones/rocks) components of ecosystems are affected very rapidly by even short-term exceedances of Critical Loads/Levels.
3. Sites with an existing exceedance of Critical Loads/Levels where there is evidence of an impending risk of extinction (due to air pollution) of a species that forms an important part of a qualifying feature.	If there is evidence that a species that forms part of a qualifying feature of the site is declining to the point of potential local extirpation/extinction, this trend is likely to continue even when pollution load drops below the point of exceedance, due to the decline continuing to be driven by stored nitrogen. In such circumstances the survival of the species may depend on depleting the stored nitrogen in the shortest possible time.
4. Sites with a highly localised and sensitive qualifying feature(s) that may coincide spatially with maxima of nitrogen deposition / ammonia concentrations from clusters of emission sources.	Where a site is designated for a particularly sensitive feature(s), and that feature is spatially limited to areas likely to be subject to air pollution impacts, there may be less confidence that declining background trends from national emission reductions will address the additional local deposition. Furthermore, if the feature is spatially limited as described, there exists the potential for the entire resource to be destroyed should such an impact occur, thus preventing the prospect of future restoration.
5. Situations where it may be inappropriate to rely on DMTs because the assumptions which underpin them do not reflect the particular circumstances which apply.	DMTs have been set at a precautionary level but the modelling which underpins the work relies on certain assumptions and variables as described in the Technical Report. Decision makers will need to consider if the use of DMTs is appropriate to the decision being taken.

These exceptional circumstance scenarios apply to both nitrogen deposition (Critical Loads) and ammonia concentrations (Critical Level). However, in the latter case there is much poorer evidence of background declines (i.e., improvements) in the UK. Ammonia is also capable of causing greater damage in a shorter period of time to plant species than oxidised forms of nitrogen[11]. For these reasons, where cases concerning ammonia are being considered against the exceptional circumstances criteria, a higher degree of confidence is needed that the modelling being used for this purpose represents a reasonable worst-case

[11] Refer ammonia pollutant overview from the Air Pollution Information System (APIS) webpage

scenario. If predicted ammonia concentrations are understated, the risk of harm occurring is greater for ammonia than it is for nitrogen deposition. A more precautionary approach should be taken to the exceptional circumstances scenarios where cases are borderline or where there are discrepancies or weaknesses in the underpinning modelling. Further justification for the ecological exception scenarios (scenarios 1-4 in table 3.1) can be found in Appendix 4. Exception scenario 5 recognises that the final decision to use a DMT rests with the decision maker and will be taken in light of the circumstances which apply for the decision to be taken.

3.3 Decision-making thresholds for on-site emission sources

Table 3.2 below sets out the decision-making thresholds (DMT) which can be applied to the process contribution (the incremental change in the concentration or deposition flux) from an on-site emission source for nitrogen deposition, NO_x and ammonia (NH_3). These are 'universal' DMT values derived on a worst-case scenario (assuming a large number of proposals coming forward over time) which can be applied to all decisions for on-site emission sources. The values may appear to be small, but they are derived on the basis of modelling outputs to ensure that the cumulative effects of plans and projects excluded from further assessment will not, over a period of time, undermine the achievement of the conservation objectives. For further details on the modelling refer section 5 of the Technical Report.

Table 3.2: Decision-making thresholds (DMT) for on-site emission sources.

	DMT	DMT as % of Critical Load/Level
NH_3 (lichens/bryophytes) (µg/m^3)	0.00079	0.08%
NH_3 (higher plants) (µg/m^3)	0.0024	0.08%
Annual Mean NO_x (µg/m^3)	0.014	0.05%
N deposition (woodland (kg-N/ha/yr)	0.013	0.13%*
N deposition (grassland) (kg-N/ha/yr)	0.0093	0.09%*

** Assumed critical load of 10 kg/ha/yr – the percentage will vary for other critical loads and can be derived by applying the following formula (DMT/Critical Load x 100).*

Subject to the exceptions set out in table 3.1, where the process contribution from an on-site source is below the DMT, no further assessment is required.

Where the process contribution exceeds the DMT there are two possible outcomes:

A. Where site-relevant thresholds have been derived (section 4 below) these can be applied to see if it is possible to avoid further assessment effort on the basis of site-specific circumstances.

B. If site-relevant thresholds have not yet been derived (for whatever reason), **further assessment in combination with other plans and projects is required**.

4 Site-relevant thresholds

4.1 When are site-relevant thresholds relevant?

The universal DMT values set out in table 3.2 are derived on a precautionary basis, for a 'worst case scenario' which assumes a high development pressure and a large number of plans and projects whose cumulative effects might, over time, be excluded from further assessment by the application of a threshold. Where site-based information is available to support a view that the universal DMT is overly precautionary, it is possible to apply a **site-relevant threshold**.

Site-relevant thresholds can be derived on a site-by-site basis, taking account of the characteristics and specific environmental conditions at a designated site. In principle, site-relevant thresholds might take account of development pressure, emission types, background trends, source attribution data and the local circumstances which apply at a given site.

A simple refinement to the universal DMTs can be made on the basis of development pressure, i.e., the likelihood of other proposals coming forward over a given time period. Site-relevant thresholds based on development pressure are provided in section 4.2 below. In this case the underpinning OCC value remains the same but the DMT is derived on the basis of modelling work which refines the perceived risk from other plans and projects coming forward over time.

Site-relevant thresholds could also be derived where a local strategic approach, such as a Site Nitrogen Action Plan (SNAP), has been implemented to deliver targeted reductions to local sources to achieve the conservation objectives for a specific site. Further information on the use of site-relevant thresholds under such circumstances is provided in section 4.3 below.

4.2 Site-relevant threshold based on development pressure

Site-relevant thresholds on the basis of development pressure are provided in table 4.2 below. The descriptions of development density referred to are given in Table 4.1 and illustrated in Figure 4.1 (extracted from the Technical Report where it appears as Figure 12). Note that 'development density' is defined in column 1 as 'the assumed number of additional new sources below the DMT within 5 km of the proposed development over 13 years'.

Table 4.1: Descriptions of development density for tables 4.2 and 4.3.

Development Density	Very Low	Low	Medium	High
Description	Remote area (very little development)	Area with nominal development	Typical agriculture / industrial area	Area experiencing intensive growth
Assumed number of *additional new* sources below the DMT within 5 km of proposed development over 13 years	1	5	10	30

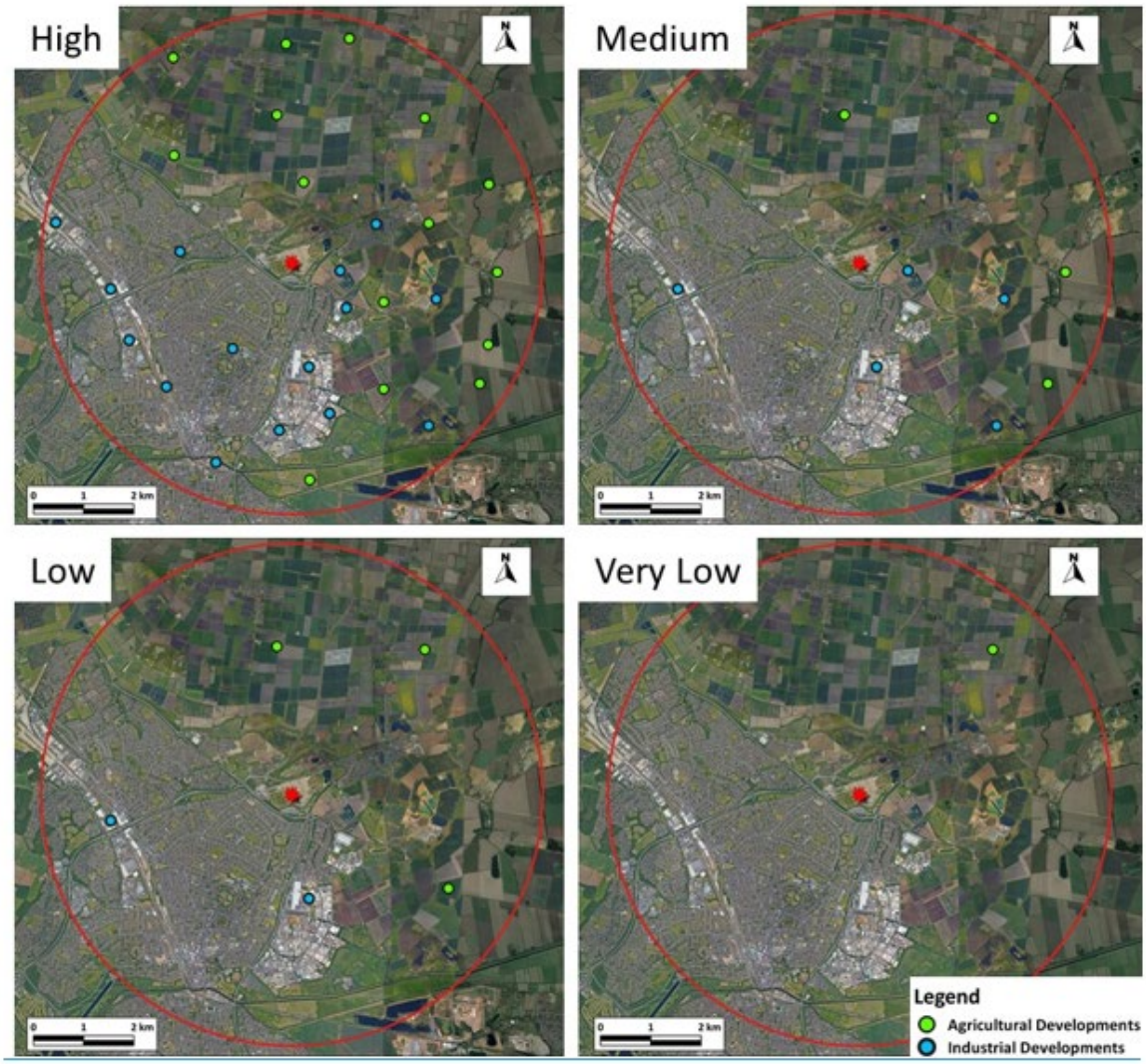

Figure 4.1: Hypothetical Visualisation of Different Development Densities. The Red Star shows the Target Project and the Red Line shows the Extent of 5 km from this Target Project. None of the locations represent real projects. Imagery ©2021 CHES/Airbus, Getmapping plc, Infotera Ltd & Bluesky Technologies (source – AQC Technical Report)

Table 4.2: Site-relevant threshold for on-site emission sources based on development pressure.

Development Density	Very Low	Low	Medium	High
NH_3 (lichens/bryophytes) (µg/m^3)	0.0075	0.0034	0.0020	0.00079
NH_3 (higher plants) (µg/m^3)	0.022	0.010	0.0060	0.0024
NO_x (µg/m^3)	0.087	0.046	0.030	0.014
N dep (woodland) for CL (kg/ha/yr)	0.13	0.057	0.034	0.013
N dep (grassland) for CL (kg/ha/yr)	0.088	0.040	0.024	0.0093

Table 4.3 shows these values as a % of the critical level or critical load (CL). Note that the % value for critical loads in table 4.3 are based on a critical load of 10kg/ha/yr and are provided for illustrative purposes. Percentage values for higher or lower critical loads will vary and can be derived by applying the following formula (SRT/Critical Load x 100).

Table 4.3: Site-relevant threshold (as a % of the critical load or level) for on-site emission sources based on development pressure.

Development Density	Very Low	Low	Medium	High
NH_3 (lichens/bryophytes) ($\mu g/m^3$)	0.75%	0.34%	0.20%	0.08%
NH_3 (higher plants) ($\mu g/m^3$)	0.75%	0.34%	0.20%	0.08%
NOx ($\mu g/m^3$)	0.29%	0.15%	0.10%	0.05%
N dep (woodland) (based on critical load of 10 kg/ha/yr)*	1.3%	0.57%	0.34%	0.13%
N dep (grassland) (based on critical load of 10 kg/ha/yr)*	0.88%	0.40%	0.24%	0.09%

** Percentage values for other critical loads will vary.*

4.3 Site-relevant threshold based on locally targeted measures

DMTs are derived on the basis of modelling work in view of a defined OCC value. The OCC is based on a predicted change over a defined timeframe taking account of national initiatives and a precautionary allowance for predicted trends in background pollution. Where a site-based approach is in place to deliver locally targeted measures to achieve the conservation objectives, the OCC value for the site can reasonably be reviewed in light of the implications of any such approach for the predicted pollutant trends.

A site-based review of the OCC value can take account of the magnitude of reductions and the timeframe for delivery of local measures which will contribute towards the achievement of the conservation objectives. Actual delivery of measures is not required prior to the OCC value being reviewed, but measures relied upon must be secured (with a clear timeframe for delivery) and associated with an appropriate delivery mechanism, such that the benefits associated with the measures are certain at the time that a decision is taken.

Any review of the OCC on the basis of local strategic approaches could reasonably be informed by the following considerations.

- The magnitude of the improvement which will be delivered (i.e., whether the measures are sufficient to achieve the conservation objectives or whether they will contribute towards their achievement with further measures still being required).
- The timescales over which the measures will be delivered.
- Source attribution data and the extent to which measures to achieve the conservation objectives might be targeted to a specific sector.
- The anticipated spatial distribution of the improvements to be delivered.

Any development of a site-relevant OCC should be carried out in consultation with relevant nature conservation body staff. Once an updated OCC value for a site has been agreed, site-relevant thresholds can be calculated on the basis of the following formula (the existing OCC values are available from Table 4 of the Technical Report):

New Site-relevant Threshold = New OCC x Old DMT / Old OCC

5 Thresholds for roads

5.1 Why are road sources treated differently to on-site emission sources?

In developing decision-making thresholds, it is necessary for road source emissions to be treated differently from on-site emission sources for two reasons.

- **Air quality effects associated with road sources are generally subject to assessment as part of the development and adoption of a higher tier plan so project level assessment may not be necessary.** Increases in emissions from roads most frequently arise as an indirect consequence of development (i.e., higher traffic flows arising from new housing / growth). Effects from development related traffic flows are most appropriately subject to assessment as part of the development and adoption of a strategic land use plan where predicted effects from overall growth are assessed. When a plan level assessment includes the assessment of road emissions, the determination of lower tier 'project' level planning applications (provided for by the plan) will rarely require further assessment in this regard as they can 'adopt' the conclusions of the earlier assessment (refer 5.2 below).

- **Air quality effects from road sources will co-locate**. Irrespective of the location of development proposals giving rise to traffic the 'footprint' of an effect from road traffic on a given protected site is dictated by the existing road network and its proximity to the designated site. Unlike on-site emission sources, the 'effects' of geographically dispersed development proposals will co-locate along the line source of a given road. The modelling approach adopted for on-site emission sources is not therefore appropriate.

Section 5.2-5.4 and Appendix 5 provide some important context to decision making in respect of road sources under the Habitats Regulations, although the underlying principles apply equally in the case of A/SSSIs. The proposed thresholds for the assessment of road source emissions are then set out in sections 5.5-5.7.

5.2 How further assessment at project level might be avoided by adopting the conclusions of an earlier plan HRA

The Habitats Regulations apply to both plans and projects. In principle, the implications of traffic growth (and associated increases in emissions on the existing road network) are relevant both to the assessment of strategic plans and also to individual projects. It is therefore possible to envisage a duplication of assessment arising where an assessment of an individual project (provided for in a higher-level plan) fails to recognise, or take account of, the findings of an earlier plan based HRA.

The Regulations anticipate this scenario in regulation 67 which concerns 'competent authority co-ordination'. Government guidance to competent authorities has been produced in this regard[12] (relevant to the assessment of all plans and projects) which provides advice on how and when competent authorities should adopt a co-ordinated approach to fulfil their responsibilities under the Habitats Directive. Government guidance states that competent authorities should take a strategic approach by dealing with proposals that have similar impacts in the same way and that they can use an HRA previously carried out where certain

[12] Refer https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

criteria are met. It is therefore possible that previous assessment effort may avoid the need for further assessment effort as part of a project level HRA.

5.3 Applying the Government guidance to the assessment of traffic emissions

All planning decision are made in accordance with the relevant strategic land use plans (and any supplementary planning documents) which will have been subject to prior assessment under the Habitats Regulations. **The Regulations therefore anticipate that a plan HRA will have already identified (and addressed) any concerns in respect of the overall changes in traffic flow for European sites as a consequence of the plan being adopted.** Where a project is subject to HRA and a previous HRA has been undertaken in respect of a higher-level plan (under which the project comes forward), Government guidance[13] encourages competent authorities to adopt elements of that earlier assessment where they are satisfied that:

- there's no new information or evidence that may lead to a different conclusion
- the assessments already done are relevant, thorough and correct
- the conclusions are rigorous and robust
- there's no new case law that changes the way an HRA should be carried out or interpreted

Where these criteria are met, there is no need for further assessment effort with regard to the effects of road traffic emissions at project level HRA for development provided for within a plan. It is therefore unlikely that a need for individual project HRAs for road traffic emissions will arise with any degree of frequency as a matter of course. It is certainly not the case that the frequency of individual project HRAs in respect of traffic emissions will correspond to the rate at which new development proposals come forward generally.

Where these criteria cannot be met further consideration is required.

5.4 Where the Government guidance criteria are not met

In some cases, it may not be possible for a decision maker to adopt the reasoning, conclusion or assessment of the earlier plan HRA in respect of the assessment of traffic growth associated with a development proposal coming forwards under that plan. Such a scenario may arise under any of the four bullet points referred to in 5.3 above. One reason which might legitimately prevent a decision maker from adopting the findings of an earlier plan HRA is where case law has emerged, in the intervening period, which renders the findings or conclusions of the earlier plan HRA vulnerable to legal challenge.

Where it is not possible to adopt the findings of an earlier plan HRA, for whatever reason, two potential options arise.

1) Firstly, an assessment of the effects of associated emissions from predicted traffic growth, either alone or in combination with other plans and projects, is undertaken as part of project level HRA for development proposals. This option is sound in

[13] Refer https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

terms of compliance, but the rate at which planning applications come forward means that it will:

a) impose a considerable assessment burden on individual applicants, and

b) lead to a duplication of assessment effort as the overarching plan already identifies 'other projects' so the underpinning modelling work for an in-combination assessment of each individual project will largely be replicated.

2) Alternatively, the Local Planning Authority can decide to review and update the earlier plan HRA as necessary in respect of the assessment undertaken and the conclusions reached for the effects of traffic emissions. This has the benefit of the underlying modelling work being undertaken once, for all allocated development. Once this review/update has been completed future HRAs of individual planning permissions can, once again, adopt the updated assessment avoiding the need for further assessment effort where proposals are provided for within the relevant land use plan.

Where development proposals provided for within a higher-level plan are unable to rely on earlier plan HRA two factors are important to bear in mind:

- Firstly, such scenarios are likely to be **localised** to plan areas where the plan HRA cannot be adopted (for whatever reason) and the Plan-making authority has *either* decided against a review of the earlier plan HRA *or* has not yet completed such a review.
- Secondly, any such scenario will be **temporary** in nature until *either* the existing plan HRA is reviewed and updated, *or* the plan period expires and a new plan HRA is required.

Looking beyond the scenarios which apply for development provided for within a high-level plan considered above, individual project HRA might also be required in respect of development proposals out-with the framework of a higher-level plan. It is reasonable to anticipate that the spatial constraints referred to above would also be relevant in respect of development coming forwards out-with that provided for within a local plan. Of particular relevance, it is unlikely that 'clusters' of projects affecting road traffic flows would arise.

When determining decision-making thresholds for road emissions it is necessary to recognise the spatial and temporal constraints which apply in terms of the frequency with which the thresholds are likely to be applied in a decision-making context. The inherent risks from proliferation are lower than for on-site emissions sources.

5.5 A zone of influence for road emissions for plan HRA

Where a land use plan is subject to HRA, the inherent nature and scale of the overall development provided for within such a plan means that the application of a decision-making threshold is not considered to be appropriate. A decision-making threshold is defined in terms of a contribution from 'an individual source' and a land use plan is essentially comprised of numerous individual projects (sources) so the definition does not apply. Applying the same decision-making threshold to both plans and projects is not logical.

The nature and scale of development provided for within land use plans are such that **all plans should be subject to assessment either alone or in combination with other plans and projects**. However, to avoid legislative overkill in undertaking an assessment of the effects of traffic emissions associated with a local land use plan, a zone of influence

approach is necessary. Only European sites within the zone of influence should be included with the scope of the HRA work to be completed. **For the purpose of decision-making, unless local circumstances support a wider zone, plan HRA should take account of the potential effects of traffic emissions on European sites located within 10 km of the plan boundary.** This zone is based on professional judgment recognising that the effects of growth from development beyond 10 km will have been accounted for in the Nitrogen Futures[14] modelling work business as usual scenario.

5.6 A decision-making threshold for road emissions for project HRA

As set out in section 5.4, proposals which will require assessment of road-based emissions as part of a project level HRA are limited to:

- Development provided for within a higher-level plan where it is not possible to adopt the conclusions of an earlier plan HRA
- Other projects out-with the development provided for within a higher-level plan
- Ad hoc projects unrelated to development which lead to an increase in traffic flows such as road schemes/improvements or intensification of existing activities.

It is therefore the case that project level assessment which are relevant to road emissions will be spatially and temporally constrained. When considering the use of thresholds for road emissions, the risk of local clusters of 'other plans and projects' coming forwards which might act in-combination upon a given road is, likewise, constrained.

The derivation of the decision-making threshold to be applied in project level HRAs for road emissions is explained in section 7 of the Technical Report. The associated effects from increased traffic flows have been calculated as a percentage of baseline traffic growth over 5 years and **a threshold of 0.15% of existing AADT (Annual Average Daily Traffic) the road concerned is proposed for individual projects**. Table 5.1 illustrates what a project level threshold would be for different AADT values

Table 5.1: Example of threshold for different AADT values.

Existing AADT (no. of vehicles)	Threshold
5,000	7.5
10,000	15
20,000	30
50,000	75

When undertaking a project level HRA to consider the effects of an *individual* development proposal on traffic related emissions on the existing road network, strategic 'trunk roads' should be excluded from the scope of the assessment. The trunk road network forms the core of the national transport system. Trunk roads are central to long distance travel and connectivity across the UK and traffic patterns on trunk roads are a consequence of

[14] Refer https://jncc.gov.uk/our-work/nitrogen-futures/

predicted growth across the UK generally. It is not practically feasible to include a trunk road when considering the indirect effects of traffic from an individual development proposal. The effects of development on traffic flows on truck roads are more appropriately taken into account as part of national and regional strategic plan level HRAs. Trunk roads include those listed on the following webpages:

- For England access Roads managed by Highways England
- For Scotland access Official list of trunk roads
- For Wales access Welsh Government strategic road network map
- For Northern Ireland access Link Corridors and Trunk Roads brochure

By way of clarification, individual road schemes which directly concern trunk roads (e.g. junction improvements or dualling projects) should always be subject to HRA in their own right - it is only the indirect effects from increased traffic flows on trunk roads, as a result of local development proposals, which should be restricted to plan level HRAs.

5.7 Road-relevant approaches for road traffic

The concept of site-relevant thresholds for traffic is misleading as a given designated site may be affected by more than one road, and each road will represent a different risk to the site and its qualifying features. It is possible however to apply a road-relevant approach based on the distance between the affected road and the nearest boundary of a European site.

Table 5.2 below provides the AADT change which is required to trigger an exceedance of 1% of the critical level (atmospheric pollutant concentrations) at different distances from a road. The 1% threshold is taken from the Natural England guidance document on the assessment of traffic emissions[15] as the threshold to be applied as part of an in-combination assessment. Table 5.2 does not allow for changes to the make-up of the vehicle fleet beyond 2019 for NO_x and beyond 2015 for ammonia. Table 5.3 provides the same information for the AADT growth which triggers an exceedance of 1% of the critical load for nitrogen deposition. Two datasets are presented depending on the structural characteristics of the qualifying habitat concerned (short vegetation or taller 'forest' vegetation).

[15] Natural England's approach to advising competent authorities on the assessment of road traffic emissions.

Table 5.2: Illustration of AADT change required to trigger exceedance of 1% of critical levels as a function of distance from the edge of a road.

Distance from Road (m)	1% of CL for NO_x (30 µg/m^3)	1% of CL for ammonia (1 µg/m^3)	1% of CL for ammonia (3 µg/m^3)
25	547	731	2,194
50	917	1,145	3,434
100	1,620	1,791	5,372
150	2,410	2,327	6,980
200	3,242	2,802	8,406

Table 5.3: Illustration of AADT increase required to trigger exceedance of 1% of critical loads for nitrogen deposition (forest vegetation and short vegetation) as a function of distance from the edge of a road.

Distance (m)	1% of CL (5 kg-N/ha/yr)	1% of CL (10 kg-N/ha/yr)	1% of CL (15 kg-N/ha/yr)	1% of CL (20 kg-N/ha/yr)
Deposition to forest vegetation				
25	207	415	622	829
50	303	606	909	1,212
100	443	887	1,330	1,773
150	554	1,108	1,661	2,215
200	648	1,297	1,945	2,594
Deposition to short vegetation				
25	359	717	1,076	1,434
50	529	1,058	1,587	2,116
100	780	1,561	2,341	3,121
150	980	1,959	2,939	3,918
200	1,151	2,302	3,453	4,604

Tables 5.2 and 5.3 are provided to enable readers to take account of the specific circumstances which apply. When the AADT thresholds (from section 5.6) are compared to the AADT change required to trigger an exceedance of 1% of the CL at the distance concerned, it may be possible to apply a common sense / professional judgement-based approach to argue that the AADT change from the project subject to assessment can properly be ignored, in spite of the threshold having been exceeded.

By way of example, where an affected road with existing AADT of 5000 is located 100 m from the boundary of a site for which a critical load to a woodland feature of 10 kg/ha/yr applies, a DMT of 7.5 vehicles applies. However, the DMT is derived on a precautionary basis which assumes that a designated site is adjacent to the road concerned. It can be seen from table 5.3 that, where the distance between the road and the site boundary is 100 m an AADT change of 887 vehicles is necessary to trigger a 1% exceedance of the critical

load at the site boundary. If the predicted change in traffic along the road from the development is 15AADT it may be reasonable to assert that there is no credible evidence that the effects of other plans and projects would ever be such to lead to an overall change of 887AADT, in spite of the fact that the decision-making threshold from table 5.1 (7.5 vehicles) is exceeded.

Whilst a risk is sufficient to trigger the need for further assessment effort it is necessary to keep in mind that there needs to be credible evidence that the risk is real, and not purely hypothetical. In some cases, it may be possible to eliminate the need to do an in-combination assessment on the basis of a lack of credibility of there being a real risk. **Any road relevant approach should involve consultation with the appropriate nature conservation body; the decision-maker must have regard to any advice that is provided.**

Appendix 1: What is Objective Compliant Change (OCC) and how has it been derived

Objective Compliant Change (OCC) is defined as 'a quantified magnitude of change, across a defined period of time, which will not undermine the achievement of the conservation objectives'. The OCC concept is derived for the purpose of assessing the risk from a new emission source to ecological receptors. A detailed description of how the OCC has been derived is provided in the accompanying technical report[16]. This appendix provides a summary of the underpinning justification for the OCC, from a perspective of compliance with underpinning legislative frameworks. The focus is on compliance with the Habitats Regulations but, the underpinning justification is equally relevant to SSSIs and the concept of favourable condition.

The importance of the conservation objectives

It is established case law that, when considering whether a plan or project has a likely significant effect upon a European site in accordance with the Habitats Regulations, an effect is only 'significant' if it undermines the conservation objectives.

The centrality of the conservation objectives is carried forward into the scope of the appropriate assessment and the application of the integrity test. In the case of *Holohan*[17] the court considered the scope of an appropriate assessment and stated that '*before the plan or project is approved, all the aspects of the plan or project which can, either individually or in combination with other plans or projects, affect the conservation objectives of that site must be identified*'. An appropriate assessment therefore must consider all aspect of a proposal that can affect the conservation objectives.

When considering the integrity of a site, EC guidance[18] explains that 'It is clear from the context and from the purpose of the Directive that the 'integrity of a site' relates to the sites conservation objectives.' The guidance continues:

> *If none of the habitat types or species for which the site has been designated is significantly affected* then the site's integrity cannot be considered to be adversely affected… However, if just one of them is significantly affected*, taking into account the site's conservation objectives, then site integrity is necessarily adversely affected'…*
>
> > *'A site can 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.'*

*In this context the phrase 'significantly affected' must be interpreted in light of the paragraph above such that it implies an undermining of the conservation objectives.

When considering a proposal under the Habitats Regulations, the conservation objectives run as a central thread throughout the whole assessment process. When testing for a 'likely significant effect', the question being asked is whether it is possible that a plan or project might undermine the conservation objectives. The purpose of the appropriate assessment is

[16] JNCC Report No 696 Technical Report - *De minimis* and Air Pollution Thresholds (December 2021)
[17] Case C-461/17 *Holohan* v An Bord Pleanala, 7th November 2018
[18] Managing Natura 2000 sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC (EC Nov 2018) (refer section 4.6.4)

then to consider all aspects of a proposal that can affect the conservation objectives. A site can be described as having a high degree of integrity where the inherent potential for meeting site conservation objectives is realised; if the conservation objectives are undermined then site integrity is necessarily adversely affected.

In considering the setting of a threshold below which effects can properly be ignored for decision-making purposes it is therefore appropriate to define any such threshold with reference to the conservation objectives. Conservation objectives are described in terms either 'maintaining' or 'restoring' ecological targets and attributes. Undermining a conservation objective therefore involves *either* a) hindering the maintenance of existing ecological conditions (where the objective is to maintain) *or* b) compromising the delivery of necessary improvements to ecological conditions (where the objective is to restore).

In terms of compromising the delivery of a restore objective, hypothetically speaking, *any* additional contribution might be argued to compromise the delivery of improvements. The logic underpinning that argument bears scrutiny however, as it is based on an assumption that all sources are equally amenable to control and that measures to deliver improvements will be applied in a proportionate manner to all sources. Where an effect is a consequence of multiple sources, it is reasonable to assert that all sources contribute to the 'effect' or *problem*. Having said that, in practice, the delivery of measures to secure necessary improvements will always be targeted to those sources which are a) amenable to future control and b) make the greatest contribution to the 'problem'. When it comes to decision-making, whilst a new plan and project may contribute to an existing *problem* it may (or may not) be part of a *solution*, or otherwise compromise delivery of that solution.

By way of example, when securing reductions in air quality emissions, available measures generally deliver a step reduction. Covering an existing slurry lagoon will deliver a reduction in ammonia emissions of 50% (floating cover) or 80% (rigid cover). Regular washing down of dairy collecting yards will reduce emissions by 70%. Most measures are an 'on/off' affair; they cannot be dialled up or down to deliver a defined reduction on a case-by-case basis.

Where critical loads or levels are exceeded as a result of existing sources, the delivery of a restore objective will most likely involve the delivery of specific measures directed to a number of local sources. Measures will be identified and delivered to maximise the benefits which might be secured whilst ensuring a pragmatic and proportionate approach to environmental stewardship. Where this is the case it is unreasonable to adopt a position that *all* new emissions must, by definition, undermine the achievement of the conservation objectives. It is certainly reasonable to argue that some 'small' level of change will be of no consequence to the delivery of measures which are necessary to achieve the conservation objectives.

The critical step in defining an OCC value is therefore in quantifying what that level of acceptable change should be.

Considering environmental change in light of the conservation objectives

Air quality change can arise in a cumulative manner, over time, as a consequence of the cumulative effects of numerous individual sources. **Before setting decision-making thresholds (DMTs) to be applied to an individual sources, it is first necessary to define a level of environmental change which would not have the potential to undermine the conservation objectives**. This value is referred to as 'Objective Compliant Change' (OCC) where the 'objective' referred to is the conservation objective in respect of air quality. The OCC takes account of the extent to which a quantified change, over a defined period of time, might undermine the achievement of the conservation objectives for a site. In other words, where the cumulative effects of plans and projects do not exceed the OCC value, those

projects would not undermine the conservation objectives for a site. **It is central importance to recognise that OCC refers to an overall level of environmental change, over a given timeframe. OCC is not defined in terms of change from an individual source at a given point in time such that the creeping cumulative effects of many small proposals might be overlooked.**

Given that OCC is defined in view of the conservation objectives, a proposed approach to how an OCC value might be derived was tested through an ecological workshop. Delegates from the research community, statutory nature conservation advisers and ecological practitioners were invited to attend the workshop (attendee organisations are listed in the acknowledgements section). The purpose of the workshop was to seek views from recognised experts across the ecological community.

The JNCC Nitrogen Futures project predicted 1 km^2 average concentrations and deposition fluxes across the UK in the base year of 2017 and in two separate 2030 baseline scenarios for current national emissions; one without implementation of national strategies and one with. Objective Compliant Change values can be derived for both nitrogen deposition and NO_x on the basis of predicted improvements in these pollutant levels. For ammonia, a different approach is required as future predictions do not show an improvement. The OCC is derived on a precautionary basis as follows:

- The Nitrogen Futures model forecasts already include predicted growth (i.e., all plans and projects which are expected to come forward over this period). At a very high level therefore, the modelling already shows that all anticipated UK plans and projects will not, on aggregate, prejudice the downward trajectory in NO_x concentrations and nitrogen deposition fluxes. There are, however, significant uncertainties regarding the quantum of growth and its spatial distribution, so the OCC assumes that all new plans and projects represent new development over and above that already taken into account in the predicted improvements. In reality many of the projects will have already been accounted for.
- The predicted improvements from which the OCC is derived assume only 25% of the measures set out in the National Air Pollution Control Programme are delivered. Whilst there is uncertainty associated with delivery of the full suite of measures within the programme, in practice it is reasonable to anticipate that progress will exceed 25% of the measures necessary to meet statutory targets.
- The OCC value is selected on the basis of professional judgment at 20% of the precautionary assumption of actual improvements (i.e., 20 % of 25% or, to look at it from another perspective, 5% of the 'most likely' NACP driven improvements). The OCC value is derived in respect of a defined time period. It considers the overall change that might occur across a defined timeframe as a result of all proposals that might come forwards without individual assessment. The risk of a creeping cumulative deteriorating trend is therefore avoided.
- In addition, the ecologists agreed that the predicted level of change in NO_x concentration or nitrogen deposition was of a magnitude that could not be related to meaningful or even detectable ecological change over the defined time period.

Workshop delegates were asked to complete a questionnaire. Of the twenty delegates that attended, 15 completed questionnaires were submitted. The first questions asked delegates for their views as to the proposed approach to the setting of an OCC value and the responses are summarised in table A1.1 below.

Table A1.1: Summary of ecological workshop delegates responses.

Question	Yes	No	Possibly
Do you agree that, using the method explained in the workshop, it should be possible to set an [Objective Compliant Change] value for Nitrogen deposition that could be applied in at least the majority of cases (e.g. subject to certain defined exceptions)?	12	0	3
The method used to derive an objective compliant change category could be based only on measures that are already committed (the '2030 BAU' scenario). Is it appropriate to take into consideration at least some of the additional measures that would be needed to deliver the UK's commitments under the National Emissions Ceiling Directive (NECD) as modelled in the '2030 NAPCP+DA' scenario?	8	2*	5

* 'No' responses indicated preference for a BAU scenario on a precautionary basis.

Deriving an OCC for ammonia

In the case of ammonia, the nitrogen futures modelling does not predict an improving trend to 2030. As such the derivation of an OCC value for ammonia cannot be made against a declining baseline pollutant scenario. The OCC value for ammonia is therefore derived on the basis of a predicted change which will be of no ecological consequence. With reference to the Dutch Nitrogen Ruling, this will be change that will not affect '*the ecological situation at the site concerned'*.

When applying the Habitats Regulations, case law has established that a 'risk' of an effect is sufficient to trigger the need for further assessment. However, there has to be credible evidence that the risk is real rather than purely hypothetical. Hypothetically any new proposal represents a non-zero change which might be detectable within modelled outputs. In practice that risk is only real, in ecological terms, where the predicted change that might arise, over a defined period, is ecologically relevant. The workshop questionnaire also asked delegates for their views as to the proposed approach to the setting of an OCC value for ammonia and the responses are summarised in table A1.2 below.

Table A1.2: Summary of ecological workshop delegates responses.

Question	Yes	No	Possibly
For Ammonia, no nationally applicable improvement is anticipated up to 2030. However, it might be possible to define an additional amount of Ammonia that is so small as to have no reasonable prospect of affecting a European Designated Site (e.g. a fraction of the most stringent Critical Level of 1µg/m3) and which would not render post 2030 efforts to reduce Ammonia levels to below Critical Levels materially more difficult. Would this be an acceptable basis for defining an OCC from which a decision-making threshold might be derived?	9	3*	3

* No responses indicated concern given the potentially more damaging effects of ammonia.

In the case of ammonia, the OCC value has been set to reflect a predicted quantum of change from all sources, over a defined period, where there is no credible evidence of a real

risk that the ability to achieve the conservation objectives for ammonia, at a future point, will be undermined. In the absence of predicted improvements, the proposed OCC corresponds to a level of change which is regarded as ecologically inconsequential.

Can an OCC be reviewed?

It is important to recognise that the OCC values presented in this report are derived on the basis of current understanding and best available information which is relevant to air quality and current predicted trends. The OCC values presented in this report are derived on the basis of national pollution trends, they are generic and can be applied to all designated sites. The OCC should be subject to routine reviews in any event to ensure that the 'Assessment in Advance' from which the decision –making thresholds have been derived remains up to date.

An OCC is a quantifiable value defined with reference to the conservation objectives. As such, beyond any routine reviews an OCC may reasonably be reviewed in circumstances which are relevant to the ecological implications of change for a given site. At the time of writing, there is an increasing shift towards recognition of a need for locally targeted strategic approaches to deliver the reductions in air pollution that will be necessary to achieve the conservation objectives for individual sites. The OCC values were originally derived in the absence of any locally targeted measures but, in principle, should a local strategic approach be implemented for a particular site, there is no reason why the OCC value might not be reviewed for that site, allowing for the derivation of site-relevant DMTs.

Three potential scenarios are relevant in this context:

A. In the absence of locally targeted measures some reductions might nevertheless be anticipated from national initiatives and policies. In this scenario a level of acceptable change can be set in light of the extent to which the measures are 'secured', the expected reductions to be achieved (i.e., the progress made towards achieving the conservation objectives) and the timescales for delivery. **Scenario A describes the approach taken in respect of the OCCs for NO_x and N deposition.**

B. In the absence of locally targeted measures and where no reductions are anticipated from national level initiatives, a level of acceptable change can be set on a highly precautionary basis in light of the ecological consequences of change and credible evidence of a real risk to the qualifying features for which a site has been designated. **Scenario B describes the approach taken in respect of the OCC for ammonia.**

C. Where a strategic approach is in place to deliver the necessary reductions from local sources sufficient to achieve the conservation objectives, a level of acceptable change can be set in light of the extent to which the measures are 'secured', the timescales for achievement of the conservation objectives and the extent to which over-delivery (i.e., the creation of environmental capacity) may arise. **Scenario C would enable a review to be undertaken for the OCC which had been derived on the basis of scenarios A and B.**

Appendix 2: The importance of decision-making thresholds (DMTs) and how they have been derived

Having defined an OCC vale which is compliant with the conservation objectives, the next step is to define a decision-making threshold (DMT) which might be applied to an individual source. In considering sources in isolation however it is necessary to recognise that the effects from individual sources which might escape individual assessment will accumulate over time. The need to consider the effects of a given proposal either alone or in combination with other plans and projects is of central importance to the protection of designated sites.

Exempting individual sources on the basis that they are 'small' can lead to unacceptable adverse effects if the rate at which 'small' developments might come forwards is not properly taken into account. On the one hand undertaking an individual assessment for all proposals which have *any effect whatsoever* will result in legislative overkill; on the other hand, exempting proposals from further assessment without considering the ecological consequences of doing so may result in legislative oversight.

Case law has established that the Habitats Directive does not preclude the use of thresholds to exempt certain proposals for further assessment[19]. However, in order for a threshold-based approach to be compliant with the requirements of the Directive a decision maker must be satisfied, through what is essentially an appropriate assessment carried out in advance, that those plans and projects exempted by such thresholds will not have an adverse effect on the integrity of the site concerned. In other words, in setting a threshold it is necessary to be satisfied that the cumulative effects of sources excluded from further assessment will not, over time, undermine the achievement of the conservation objectives. It is necessary to interpret and apply the in-combination provisions in a proportionate manner. This is of particular importance where air quality assessments are concerned as, in principle, the precision of air quality modelling tools is such that all proposals have a 'non-zero' contribution at significant distances. There comes a point however at which the relevance of a contribution to a decision-making process must take account of the risk of such contributions in terms of meaningful ecological change.

It is therefore necessary to apply a purposive approach in the interpretation and application of the in-combination assessment requirements as set out under the Habitats Directive. It is not reasonable to argue that the Directive intends that all proposals with *any effect whatsoever* will trigger the need for an assessment in combination with other plans and projects. The use of screening criteria, zones of influence and/or thresholds to inform decision-making, and to enable consistency in the application of the in-combination provisions is necessary to avoid legislative overkill.

The modelling outputs set out in the technical report[20] provide an evidence base from which it can be demonstrated that plans and projects below the DMTs can properly be ignored. An effect is only 'significant' if it undermines the conservation objectives and the modelling results can be relied upon to demonstrate that the cumulative effects of proposals below the DMTs will not exceed the OCC value and, by definition, will not undermine the conservation objectives.

[19] The Dutch Nitrogen Ruling para 112.
[20] JNCC Report No 696 Technical Report - *De minimis* and Air Pollution Thresholds (December 2021)

The DMT is derived from an ‘assessment in advance’. However, an assessment in advance cannot reasonably be regarded as a formal in combination assessment of all future plans and projects, as it cannot reasonably be predicted where and when future proposals will come forwards. However, an assessment in advance can effectively incorporate an assessment of the cumulative effects of future plans and projects, as far as is possible, by relying of forecasts from the Nitrogen Futures project.

The IAPG, through the Nitrogen Futures project, has modelled the effects of planned national air pollution reduction strategies and plans at designated site level to develop a new 2030 baseline projection which accounts for the effects of national and international emission reductions across all UK habitats and nature designated sites.

This modelling includes an allowance for all forecast growth and activity and/or land-use changes across the UK (i.e., all growth that will be delivered through new plans and projects) to 2030, as well as an allowance for forecast changes to emissions outside of the UK. It therefore provides the best available assessment of the cumulative effects of all expected UK plans and projects over the period 2017 to 2030.

In this context, the baseline against which all new plans and projects will be assessed (whether through an assessment in advance of proposals below the decision making thresholds or an individual assessment of plans and projects above the decision making thresholds) includes an assessment of the cumulative effects of all of those plans and projects acting in-combination with one another, regardless of whether or not that they are above or below the relevant decision making threshold and regardless of whether or not they are expressly referred to in the relevant appropriate assessment or not.

It can therefore be argued that an assessment of the cumulative effects of all plans and projects that are likely to come forward in the period to 2030 has been carried out, through: -

- the incorporation of forecast growth and activity changes arising from new plans and projects into the baseline projection against which all plans and projects will be assessed (through the Nitrogen Futures project);
- the use of that baseline to determine objective complaint changes for ecological receptors, and the use of those objective complaint changes to determine decision making thresholds for individual plans and projects (through an assessment in advance);
- the use of those objective compliant changes and decision-making thresholds derived for the purposing of appropriately assessing and authorising plans and projects below the decision-making thresholds; and
- the use of the baseline to inform the individual assessment of plans and projects above the decision-making thresholds.

The approach adopted to the derivation of DMTs therefore involves the double counting of all anticipated plans and projects coming forward between 2017 and 2030, as each plan or project proposal will have already been incorporated into the new 2030 baseline (through the inclusion of forecast growth and activity changes in that baseline) but its effects will be applied to that baseline, as though its contribution to emissions and deposition rates are over and above the forecast growth from all anticipated plans and projects.

For an assessment in advance, the scientific evidence underpinning the assessment of cumulative effects must necessarily rely upon modelling data and forecasts derived through the Nitrogen Futures project because the purpose of such an assessment is to derive thresholds which can be used to determine *future* plans and projects, which are not and cannot be known at the point at which the assessment is carried out. The Nitrogen Futures data represents the best available scientific evidence for this specific task, and it is

appropriate to use it for this purpose. The assessment in advance is only be used to grant consent for the lowest risk (i.e., least nitrogen emitting) plans and projects and this is considered to be a suitably precautionary approach.

Individual assessments for projects above a threshold will still be required, and the 2030 baseline derived through the Nitrogen Futures project will be an important piece of scientific evidence that will need to be considered because it provides the best available analysis of trends in nitrogen emissions and deposition. However, as the competent authority will have knowledge of the specific plan or project proposed and the changes in nitrogen emissions / deposition associated with that plan or project at designated site(s) at the point at which the individual assessment is completed, further evidence will need to be gathered to supplement the Nitrogen Futures modelling data in order to prepare an assessment that is ‘appropriate’.

Finally, it is important to keep firmly in mind that, irrespective of whether a new proposal is subject to assessment in combination with other plans and projects at the time it was permitted, the effects of all operational consents are included within the baseline data which is regularly updated through APIS. In this way the effects from such proposals which might accrue, over time, are still taken into account in respect of future assessment effort. Contributions from proposals which are excluded from further assessment by use of a decision-making threshold are not therefore ‘lost’ as they will form part of the baseline conditions against which future decisions are to be taken. Their exclusion is justified on the basis that further assessment effort would not have changed the decision that would be taken as to whether they should be consented, or not.

Appendix 3: Review of relevant case law

The purpose of this appendix is to provide a review and analysis of case law as relevant to the use of decision-making thresholds.

In 2017 the High Court ruled in the case of ***Wealden***[21] that the application of a *de minimis* threshold in the assessment of traffic growth associated with housing development, which had the effect of avoiding the need for further assessment in combination with other plans and projects, had brought about a clear breach of the Habitats Directive. Of particular concern to the Court, was that the use of the threshold could not be supported (under the circumstances) on logical and empirical grounds (para 101). In the words of the Court, it *'cried out for further explanation'* (para 108).

The *de minimis* value in question was the use of a 1000AADT (1000 Annual Average Daily Traffic) threshold against which the effects from traffic associated with housing development had been screened out of the need for further assessment under the Habitats Regulations, either alone or in combination. The development pressure in the area, and the sheer number of residential schemes coming forward, meant that the application of such a threshold precluded an in-combination assessment of plans and projects which could reasonably be anticipated to represent a risk of a cumulative impact. The logic applied by the Court is sound and it is clear from a common-sense approach that the threshold applied was not appropriate given the specific circumstances of the case in question. The rate at which development proposals were anticipated to come forwards provided credible evidence of a real risk that the combined effects or proposals below 1000AADT might undermine the achievement of the conservation objectives.

This decision prompted a widespread review of the approaches taken to the screening of plans and projects under the Habitats Regulation. Before considering the *Wealden* decision in more detail, it is relevant to take a step back to 'set the scene' with reference to earlier case law decisions which have shaped and informed a correct approach to the in-combination requirements. Working in chronological order, this appendix firstly considers an EC parliamentary question from 2005 before then turning to the cases of Walton (2011), Newry (2015) and the Dutch Nitrogen ruling (2018).

EC Parliamentary Question

The EC parliamentary question concerns the nature of 'other plans and projects' within the context of the in-combination requirements. It reads as follows:

> *'The Commission has stated in its published guidelines entitled 'Managing Natura 2000 Sites' that it would seem appropriate to restrict the combination provision to other plans or projects which have been actually proposed. Does the Commission have a clear position on whether the term 'actually proposed' covers only plans or projects which have the force of law?'*

The direct response to the question asked is set out below:

> *'The Commission does not consider that Article 6 applies only when the other plan or project has a full force of law...'*

[21] Wealden DC v SoS and Lewes DC [2017] EWHC 351 (Admin)

The answer provided is unsurprising, given current understanding, but of relevance to the purpose and intent of the in-combination provisions (in a broader sense) in dealing with the question raised the response continues as follows:

> *'…In any event, any application of what is meant by 'actually proposed' needs to take account of particular circumstances of specific cases as well as the practical feasibility of making an assessment of combined effects. The combination provision must be applied in a manner that is proportionate to the timing, planning stage and the legality of the proposed plans and projects.'*

This further clarification provides insight into the intent and purpose of the in-combination requirements. The EC anticipates that the scope of an in-combination assessment must be practically feasible; a member state therefore needs to adopt a proportionate approach to the interpretation of the in-combination provisions.

The case of Walton (2011)

The case of *Walton*[22] concerned an appeal against the decision made by the Scottish Ministers in connection with the Aberdeen Western Peripheral Route (AWPR). The appellants argued that the decision was flawed because the report to inform the Appropriate Assessment had failed to properly consider in-combination effects. In this case the scale of the road scheme and the proposed route was such that, theoretically, a very large number of planning applications were likely to come forwards which were in geographic and chronological proximity to the AWPR. In light of the sheer number of plans and projects concerned the consultants had established criteria which had been applied to identify those with the potential to act in combination. In considering the argument that the approach did not satisfy the in-combination requirements, the Court made explicit reference to the EC parliamentary question referred to above and ruled as follows:

> *'[decision makers] were entitled to exercise judgement as to the projects with whose effect the AWPR proposal had to be considered in-combination… As regards the in-combination point, I again accept the submission on behalf of the [decision maker]. In particular, I agree that there must be a degree of flexibility in assessing the projects with which a particular proposal should be regarded as having an in-combination effect. I can detect no unreasonableness in the approach taken by the respondents and their consultants in the present case.'*

The Court clarified two important principles here; firstly, a competent authority is entitled to exercise judgement over which other plans and projects to take into account; secondly, there must be a degree of flexibility in an in-combination assessment.

The case of Newry (2015)

The decision of Newry[23] in the Northern Ireland courts concerned a challenge against the grant of planning permission and the alleged potential for associated release of sediment during construction into a watercourse. The challenge was that the Northern Ireland Environment Agency (NIEA) had failed to undertake an in-combination assessment of potential effects on the Carlingford Lough SPA some 18km downstream of the development

[22] *Walton* [2011]CSOH 131
[23] *Newry* [2015] NIQB 65

site. Of relevance to the approach taken to the in-combination assessment it was argued that the effects from the subject proposal were inconsequential…

> *'Ms Reeve further explains NIEA's position by reference to the proposal's distance from the SPA, the lack of direct disturbance to the qualifying features, and the fact that "any impacts from mobilised sediment from construction works on the supporting habitat of the qualifying features will be negated as a result of the tidal nature of Carlingford Lough (the associated mixing) and distance (dilution factors)"…*
>
> *…As a result of the matters referred to by the NIEA including the 18 km distance involved it is considered that there will be no adverse effects on the SPA. The development will not therefore contribute to any in-combination effects with other developments, including the particular developments relied upon by the Applicant.'*

NIEA had consulted the statutory nature conservation body and, recognising that they had agreed with the arguments as to the inherent potential for in-combination effects (and the lack of any credible evidence that the risk was real), the court concluded in paragraph 64:

> *'I am in agreement with the [NIEA] that these are matters of expert judgment which cannot legitimately be condemned as unreasonable. Furthermore…the decision maker was entitled in the circumstances to accept and act upon the independent expert view of the statutory consultee.'*

This decision is relevant as it establishes the important principle that a decision maker is entitled to eliminate the need to undertake an in-combination assessment on the basis of professional judgement, having regard to advice from the statutory nature conservation body. Such an approach to the application of the in-combination provisions certainly cannot be condemned as inherently unreasonable on legal grounds.

In considering the claim that the assessment had failed to identify whether, or if so to what extent, other projects were taken into account as part of the necessary in-combination assessment, the Court expressed a view (para 65) that it was pertinent to recall the reasoning in the case of Boggis (which had established a, now widely accepted, principle that any third party alleging that there was a risk which should have been taken into account must produce 'credible evidence that there was a real, rather than a hypothetical, risk'). The Court applied this reasoning to the asserted requirement to undertake an in-combination assessment, even when a decision maker is of the opinion that the effects 'alone' will not contribute to any in combination effects with other development in a meaningful manner. Para 66 concluded as follows:

> *'at no stage… did the applicant put forward credible evidence that there was a real, rather than a hypothetical risk which should have been taken into account.*

This is a perfectly sensible and pragmatic decision. Hypothetically, the assessment of every plan or project, with even the slightest effect, should also include an assessment in combination with other plans and projects. To do so however would create an overly burdensome and excessive approach which was cautioned against by Advocate General Sharpston in the case of Sweetman. This case concerned the *de minimis* argument and the Advocate General's Opinion explains how the requirement for an effect to be 'significant' lays down a *de minimis* threshold. Para 48 recognises the inherent dangers which arise from an excessive interpretation of the in-combination provisions:

> *'If all plans and projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill'.*

Back to Wealden

The Wealden judgment is significant, but it needs to be read and interpreted in light of other, well established principles. Looking back over the earlier decisions which have shaped our understanding of in-combination effects these can reasonably be summarised below:

- In combination provisions must be interpreted and applied in a proportionate manner. An in-combination assessment must be practically feasible (refer EC parliamentary question 2005)
- There must be a degree of flexibility in an in-combination assessment and the competent authority is entitled to exercise judgment over which other plans and projects to take into account (refer to the Scottish case *Walton* 2011)
- A decision maker is entitled to eliminate the need to undertake an in-combination assessment on the basis of professional judgement, having regard to advice from the statutory nature conservation body. There should be credible evidence that there is a real, rather than a hypothetical, risk to the site (refer Boggis and *Newry* 2015).
- The need for an effect to be significant lays down a *de minimis* threshold. If all plans and projects having any effect whatsoever were to be caught by Article 6(3), activities on or near the site risk being impossible by reason of legislative overkill (refer Advocate General's Opinion in Sweetman)

Keeping these principles firmly in mind it becomes increasingly important to note that, in ruling against the use of the 1000AADT threshold, nothing in the Wealden decision suggested that the use of a threshold-based approach was unacceptable in principle. Indeed para 95 explicitly recognised that '*if it is known that specific impacts are very low indeed, or are likely to be such, these can properly be ignored'* (emphasis added).

The Dutch Nitrogen Ruling

Subsequent to the *Wealden* decision, in 2018 the CJEU handed down their judgment in respect of a case which is commonly referred to as the *Dutch Nitrogen Ruling*[24]. This case was a reference for a preliminary ruling from the domestic courts in the Netherlands with reference to a wide-ranging list of questions. A full analysis of the decision is not appropriate, but one question is of particular relevance to the legality of the use of thresholds to inform decision-making under the Habitats Directive.

A key point acknowledged by the Court was that where the conservation status of a designated habitat is unfavourable, the possibility of authorising further activities which will add further pollutant loaded is 'necessarily limited'. The Court went on however to address a question of interest to the use of thresholds which was summarised by the Court as follows (para 105):

> *'whether Article 6(3) of the Habitats Directive must be interpreted as precluding national programmatic legislation, such as that at issue in the main proceedings, exempting certain projects which do not exceed a certain threshold or limit value in terms of nitrogen deposition from the requirement for individual approval, since the cumulative effects of all plans and projects likely to create such deposition were subject in advance to an 'appropriate assessment' within the meaning of Article 6(3)'.*

[24] CLEU Joined Cases C-293/17 and C-294/17 Cooperatie Mobilisation v Stitchting Werkgroep Behoud de Peel, 7 November 2018.

In responding to the question, paragraph 112 clearly establishes that, in principle, the application of thresholds or limit values is acceptable under the Directive. It states:

> *'Article 6(3) of the Habitats Directive must be interpreted as not precluding national programmatic legislation, such as that at issue in the main proceedings, exempting certain projects which do not exceed a certain threshold value or a certain limit value in terms of nitrogen deposition from the requirement for individual approval…'.*

However, paragraph 112 does not stop there. It continues to explicitly set out the criteria which must be met to enable such a threshold approach to be relied upon. It continues…

> *'…if the national court is satisfied that the 'appropriate assessment' within the meaning of that provision, carried out in advance, meets the criterion that there is no reasonable scientific doubt as to the lack of adverse effects of those plans or projects on the integrity of the sites concerned.'*

The acceptability of thresholds in principle reflects the Advocate General's Opinion in Sweetman (already referred to) that 'The requirement that the effect in question be 'significant' exists in order to lay down a *de minimis* threshold. Plans or projects that have no appreciable effect on the site are thereby excluded.' Furthermore, is validates the approach taken by the High Court in the Wealden decision that the use of the threshold needs to be supported 'on logical and empirical grounds'.

Conclusions

It is therefore now an established position of the Courts that thresholds form an acceptable basis upon which to exempt proposals from the need for individual assessment. Whilst thresholds are acceptable in principle, the ability to authorise additional pollutant loading is necessarily limited where the conservation status is unfavourable. In order to be able to rely on the use of a threshold-based approach it is necessary to undertake some form of prior assessment. The assessment carried out in advance must meet certain criteria; it must demonstrate that there is no reasonable scientific doubt as to the lack of adverse effects of *those plans or projects* on the integrity of the sites concerned.

In applying this criterion, it is necessary to correctly understand which 'plans and projects' the Court has in mind in the Dutch nitrogen ruling. The ruling refers to '*those* plans and projects' which is clearly restrictive in its scope. It is not appropriate to seek to test a proposed threshold by means of a prior appropriate assessment which takes account of *all* plans and projects – that would be internally inconsistent with the very aim and purpose of a threshold-based approach.

It is reasonable to argue that the plans and projects referred to are restricted to *those* plans and projects which would be excluded from further assessment by the application of a proposed threshold. This interpretation is logically coherent and is supported with reference back to how the Court summarised the question which they were providing an answer by referring to the assessment in advance of '*the cumulative effects of all plans and projects likely to create such deposition'* (paragraph 105). *Likewise, p*aragraph 108 refers to a prior assessment where the effects *'of plans and projects of that scale were* examined'. The referring Court was clear that their assessment in advance was concerned with the cumulative effects of proposals which contribute deposition below a threshold value. If the CJEU had other plans and projects in mind it would be a significant oversight not to clarify that within the judgment itself.

The assessment carried out in advance must therefore demonstrate that there is no reasonable scientific doubt as to the lack of adverse effects from the *plans or projects*

excluded from further assessment by the application of a threshold for the integrity of the sites concerned.

This interpretation also aligns with other case law as the assessment carried out in advance would then provide an evidence base upon which it can be demonstrated, *on logical and empirical grounds* (refer Wealden), that the cumulative effects of proposals excluded from further assessment by a proposed threshold will not have an adverse-effects to the integrity of the site concerned. Such proposals can *properly be ignored* (Wealden).

Appendix 4: The Exception Scenarios

Introduction

This Appendix, and section 3.2 of the main report, have been drafted by Ecological Planning & Research Ltd[25]. It outlines the range of exceptional circumstances in which it is unlikely to be appropriate to apply the Decision-Making Thresholds (DMTs) derived on the concept of Objective Compliant Change (OCC) for the purposes of screening out projects from further assessment on the basis that they make only an inconsequential contribution to air pollution on a designated site.

The scenarios that are considered to represent exceptional circumstances meaning that the DMTs cannot be safely relied upon were generated initially through a review of relevant scientific literature, which was then used to illicit opinions from national expert stakeholders during two workshops held on 23 and 26 November 2020. The feedback received enabled the range of potential scenarios qualifying as exceptional circumstances to be narrowed to those described below.

In order to understand why these particular exceptions have been identified, it is necessary to understand the mechanisms through which the additions of very small increments of nitrogen pollution might conceivably make a material (i.e., not 'inconsequential') difference to ecological outcomes in certain circumstances. The underlying mechanisms at play are therefore briefly outlined below, before the relevance and justification of and for each exceptional circumstance scenario is then explained by way of reference to these mechanisms.

Mechanisms for Potential Harm to Occur

Broadly, as described in Caporn *et al.* (2016), a line describing the response of the species richness of a habitat to long-term nitrogen deposition is curved, such that the rate of species loss is greatest at the early stages of deposition and then slows as more and more Nitrogen is then added. This can be explained by the fact that when a habitat is first subject to increasing nitrogen deposition, those species most sensitive to nitrogen will be lost first and most easily. After this point, greater and greater increments of additional nitrogen are then required to bring about the additional loss of species. This is due to the greater nitrogen tolerance of the species that still remain at higher levels of deposition. In short, whilst additional losses continue to occur, the rate of species loss slows as the rate of additional nitrogen deposition increases. Notwithstanding this relationship, it is important to note that, whilst rarer species or those of conservation importance are more likely to be more sensitive to nitrogen, this is not always the case – it is possible for important individual species to be lost throughout the deposition spectrum.

In the context of improving background levels of nitrogen pollution therefore, when taken in isolation this observation indicates that small additions of nitrogen such as that permitted by the DMTs are much more likely to have consequential effects for 'clean' sites that have not yet lost their most sensitive species. For sites that are experiencing higher rates of deposition (particularly where this has been occurring for some time), small additional increments of nitrogen, when added to an improving background trend (i.e., where the addition is not sufficient to compromise the improving trend), are less likely to have any consequential effects due to the reduced sensitivity of the habitat.

[25] Refer https://www.epr.uk.com/

This picture is however complicated by the potential for nitrogen to 'accumulate' in a habitat. This is described helpfully in Rowe *et al.* (2014). In summary, once the rate of Nitrogen deposition exceeds the rate at which nitrogen is lost from a habitat (through plant growth, herbivory, leaching, etc.), nitrogen begins to accumulate in an ecosystem (in various forms such as leaf litter, soil humus, foliar and mineralised nitrogen, etc.). The point at which this accumulation begins to occur is referred to as the 'integration threshold'. In essence, this raises the possibility that stored accumulations of nitrogen may continue to drive negative effects in a habitat long after the rate of nitrogen deposition has fallen below the integration threshold. The longer it takes for the accumulated nitrogen to 'work its way out of the system', the longer those negative effects would be expected to continue, and the greater the hysteresis observed between changes in deposition and the manifestation of effects.

Notwithstanding this complication, the basis for the DMTs is that they have been calculated to be so small as to have no consequential effect on either the total amount of stored nitrogen in a system or the length of time that this takes to be depleted once deposition rates are brought below the integration threshold. Given the observations in Caporn *et al.* (2016) that larger and larger additional amounts of nitrogen are required to cause further damage (defined in terms of species loss), and the observations in Rowe *et al.* (2014) that "…decreases in N deposition are beneficial across the range of N deposition", it is likely that the instances in which permitting projects that generate the DMT in the context of a clearly declining background of nitrogen deposition are very rare.

Further key considerations are i) the potential for the habitat or ecosystem in question to store accumulated nitrogen, and ii) the existence of prevailing influences that act to prevent nitrogen from being stored or to accelerate the depletion of stored nitrogen.

In respect of i) above, as explained in Rowe *et al.* (2014), epilithic and epiphytic ecosystems (or components thereof) have very limited capacity to store nitrogen, since soil (the main sink for nitrogen) is not present. This means that species living within epiphytic and epilithic systems, such as clean air lichens on rocks or tree bark, are much more sensitive to short-term exceedances of nitrogen deposition since the lichens absorb nitrogen directly from the surface of the rock or tree or the air and therefore experience a much greater proportionate increase in the % of total available nitrogen when rates of deposition increase. Additionally, these systems may recover from pollution much more rapidly once pollution has ceased, due to the absence of any stored nitrogen to delay recovery (NB: although recovery of species richness will require re-colonisation from surviving reservoirs of the lost species nearby, which may or may not exist). For the above reasons, long-term cumulative levels of nitrogen deposition (30 years of more) are less relevant than for soil-based systems, and short-term exceedances (c3 years) can have a greater impact.

In relation to ii) above, there is now burgeoning evidence (see for example Stevens *et al.* 2013) that certain forms of routine conservation habitat management are capable of preventing nitrogen from being stored and of accelerating the depletion of stored nitrogen (for example grazing of heathlands). The existence or absence of such management can therefore affect the degree of vulnerability to air pollution.

Explanation of Exceptional Circumstance Scenarios

Clean or pristine sites (i.e., those with very low existing levels of air pollution) where there is reason to doubt an improving background trend

Evidence presented in Rowe *et al.* (2014) and Caporn *et al.* (2016) suggests that there is evidence of species loss even preceding assigned Critical Loads/Levels. For sites currently experiencing a very low level of nitrogen deposition therefore, where species highly sensitive

to nitrogen deposition are likely to still be present, the DMT approach should not be used unless the following applies:

- There is high confidence that the declining background trend in nitrogen deposition or ammonia will outweigh the additional deposition/pollution that would otherwise be permitted; and
- That the above is true in all affected areas of the site, even though the Critical Load or Level may not be exceeded.

Sites with important sensitive epiphytic or epilithic species at or just below their critical load or level

As explained in Rowe *et al.* (2014), epiphytic and epilithic species and components of ecosystems are particularly vulnerable to increases in nitrogen deposition even if these are short-term. The capacity to store nitrogen on the surface of rocks and trees etc is very limited. This means that changes in total stored nitrogen induced by deposition are proportionally much greater in epiphytic and epilithic systems than in soil-based systems (where the store of nitrogen is much larger and where long-term cumulative increases in nitrogen are therefore more relevant).

Where therefore a site is designated for important epiphytic or epilithic species or ecosystem components that are at or just below their Critical Load or Level, the DMT approach should not be used unless there is a high confidence that the declining background trend will outweigh any increases in nitrogen deposition or ammonia concentrations in all areas of the site in both the short and the long term.

Sites already in exceedance where there is evidence of an impending risk of extinction of a species that is or forms an important part of a qualifying feature

For soil-based systems, for the reasons outlined above, in the vast majority of cases where an existing exceedance is taking place, the DMT approach should not present a risk to the site's integrity provided that there is confidence in a declining background trend in nitrogen deposition.

The exception to this is where there is evidence that nitrogen deposition or ammonia concentrations are driving the loss of an important species (i.e., a species that is either a qualifying feature or which forms an important part of a qualifying feature), and there is a risk of that species becoming locally extirpated/extinct at the site. In these circumstances, stored nitrogen may continue to drive the loss of that species even after nitrogen deposition rates drop below the Critical Load, and the prospect of preventing this loss will hinge on depleting the stored nitrogen that is driving these negative changes in the shortest possible time. In these circumstances, any delay to the achievement of Critical Loads or Levels might reduce the prospects of preventing the extinction and could not therefore be described as inconsequential.

Sites with a highly localised sensitive qualifying feature(s) that may coincide with maxima of nitrogen deposition from clusters of emission sources

For the vast majority of cases, it is unlikely that the maxima of individual Process Contributions (PCs) will coincide, and even less likely that any localised overlaps of maxima will coincide with the whole or even the majority of a qualifying site feature.

In some rare instances however, it is possible that sensitive qualifying features may be extremely spatially limited (for example occurring in one location only) and that this location may coincide with Nitrogen deposition or ammonia emissions from multiple sources. If the

qualifying feature reaches or exceeds its Critical Load/Level, then there is a prospect that even limited additional deposition might jeopardise both the existing resource of the qualifying feature and the prospect for its future restoration. This is in contrast to a more spatially dispersed qualifying feature, where restoration would be possible from surviving populations once levels of pollution were brought down).

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