

SPRING CONFERENCE 2020

Assessment and Mitigation of Air Quality Impacts on Biodiversity

4 March, Sheffield

CONFERENCE PROGRAMME	
09:00	Registration & Tea/Coffee
CHAIR: Andrew Baker FCIEEM	
10.00	Welcome, Introduction, and Housekeeping Max Wade CEcol CEnv FCIEEM
10.05	Dutch Disaster. Or: How to Prevent Significant Effects of Nitrogen Deposition on Nature (and Politics) Dick Bal, Dutch Ministry of Agriculture, Nature and Food Quality
10.30	Air Quality & HRA: De minimis Caselaw Penny Simpson, Freeths
10.55	Air Quality Assessments Under the Habitats Regulations – The Importance of a Site’s Conservation Objectives and Why we Need to Agree a Robust Approach to the Setting of <i>De minimis</i> Values Caroline Chapman MCIEEM, DTA Ecology
11.20	Tea/Coffee Break
11.45	How do we Ensure Better Consistency Within Habitats Regulations Assessment (HRA) Across Local Authorities Whose Development/Forecast Growth May Affect the Same Habitats Sites? Joanna Rochfort & Owen Peat MCIEEM, WSP
12.10	NOx and Ammonia from Road Traffic – Some Inconvenient Truths Dr Ben Marner, Air Quality Consultants Ltd
12.35	AmmoniaN2K: Improving Environmental Assessments for Atmospheric Ammonia Dr David Kelleghan GradCIEEM, University College Dublin, Ireland
13.00	Lunch
CHAIR: Professor Duncan Laxen	
14.00	Discussion Panel ‘Critical Loads and Levels, Lines in the Sand or Rule of Thumb?’
14:35	Spatial Targeting of Mitigation for Effective Reduction of Atmospheric Nitrogen Input to Sensitive Habitats and Designated Nature Conservation Sites Dr Ulli Dragosits, Centre for Ecology & Hydrology

15:00	Can Semi - Natural Habitats Recover from Atmospheric Nitrogen Deposition? Dr Carly Stevens, Lancaster University
15.25	Tea/Coffee Break
15.45	How the Environment Agency Uses Monitoring, Modelling and the Systems Approach when Assessing Potential and Actual Air-quality Impacts Richard Gould, Environment Agency
16.10	The Confounded and the Confounding: A Case Study into Air Quality and the Heathlands of Hampshire's New Forest Ben Kite CEcol MCIEEM & Andrew Cross MCIEEM, Ecological Planning & Research Ltd
16.45	Summary and Close

Biographies

Dick Bal, Dutch Ministry of Agriculture, Nature and Food Quality

Dick Bal was educated as an ecologist at Wageningen University and has worked from 1992 to the present day at the interface between government policy on nature conservation and ecological science. He is one of the authors of the integrated Programmatic Approach to tackle the nitrogen problem in Dutch Natura 2000 sites

Penny Simpson, Freeths

Within the “natural environment” niche, Penny has built a strong, national reputation in advising a wide range of private and public sector clients. She advises on the regulation of protected habitats, protected species, water resources, air quality and environmental impact assessment. Her clients are most often developers, environmental consultancies, mineral sector operators and water sector operators. Penny works with clients to overcome the constraints imposed by natural environment law so as to deliver planning permissions and the other environmental consents they need (e.g. protected species licences, environmental permits, abstraction licences). She also advises local authorities, objectors and environmental organisations on these issues. She has significant experience in defending public and private sector clients when faced with environmental-related regulatory or criminal proceedings. (e.g. pollution offences, protected species offences, breaches of permits/licences).

Caroline Chapman MCIEEM, DTA Ecology

Dr Caroline Chapman MCIEEM is an experienced practitioner in the interpretation and application of the Habitats Regulations. Caroline is the Director of [DTA Ecology Ltd](#) and previously worked for Natural England as the Air Quality national specialist. DTA Ecology has an exclusively public sector client base and Caroline is frequently called upon to provide advice concerning the assessment of air quality effects under the Habitats Regulations.

Caroline is also the co-Director of [DTA Publications Ltd](#), a company established to publish and maintain the award winning *Habitats Regulations Assessment Handbook* and accompanying Journal.

Joanna Rochfort, WSP

Joanna has over 15 years' experience within the environmental sector, including 13 years' experience in air quality. Joanna spent a year working for the Environment Agency and a further year providing environmental support to the planning policy team at Hart District Council (HDC) before joining WSP's air quality team in 2006. Joanna has worked on a range of air quality projects since joining WSP, however in recent years her work has been focused around air quality assessments to support Habitats Regulations Assessment (HRA), in particular for Plans and Projects within the vicinity of Thames Basin Heaths Special Protection Area (SPA).

Owen Peat MCIEEM, WSP

Owen has 15 years of post-graduate experience as an Ecologist and Environmental Manager and is team leader for WSP's Basingstoke Ecology team. Owen's professional experience has included the project management and delivery of ecological assessment and mitigation schemes for development projects, and habitat creation and restoration schemes through design and build projects. Owen has extensive experience in working within planning and environmental regulatory processes, on behalf of UK Government Agencies and Local Government. Owen has managed and contributed to a range of environmental best practice research and guidance documents and has advised on UK Government department policy implementation.

Dr Ben Marner, Air Quality Consultants Ltd

Ben is Technical Director of Air Quality Consultants Ltd. and has more than 20 years' experience in the field of air quality. He has been responsible for a large number of air quality assessments in the UK and abroad. He has specific experience in the application of detailed dispersion models and has contributed to the development of modelling best practices. He has provided support and advice to Defra, Highways England, the Environment Agency, Transport Scotland, Transport for London, Natural England, JNCC, and numerous local authorities. He is a member of Defra's Air Quality Expert Group (AQEG).

Dr David Kelleghan gradCIEEM, University College Dublin

David Kelleghan is a postdoctoral researcher and occasional lecturer within the University College Dublin School of Biosystems and Food Engineering. His research focuses on linking environmental and ecological impacts with air pollution, specifically atmospheric ammonia emission from agriculture. He regularly advises Irish government bodies and consultants in relation to these impacts, making recommendations for best approaches. Prior to his PhD he worked as an ecological consultant and has subsequently used his experience to ensure his research has real world applications to benefit environmental practitioners.

Dr Ulli Dragosits, UK Centre for Ecology & Hydrology (UKCEH)

Ulli is a spatial modeller and group leader with >20 years' experience in spatial data analysis, with a research focus on air pollution from agricultural and non-agricultural sources, greenhouse gases and mitigation, at the national scale (1/5 km grid resolution) and landscape scale (individual farms & fields), and historic long-term trends. She leads on the annual emission maps for these sources for the UK National Atmospheric Emissions Inventory (naei.beis.gov.uk), and scenario modelling for mitigation strategies and effects on receptors across a number of projects. She has led many research projects for the UK government, agencies etc.

Dr Carly Stevens, Lancaster University

Carly is a plant ecologist and soil biogeochemist with an interest in how global change is impacting on our environment. In particular she is interested in how atmospheric nitrogen deposition is impacting on ecosystems and how they function.

Richard Gould, Environment Agency

After completing a PhD in the mid-1980s on the impacts of air pollution on crop plants, Rick Gould worked in research overseas in the USA and Sweden, before returning to the UK in the early 1990s, working in consultancy for several years. He has since worked for the Environment Agency for 20 years, within the Monitoring & Assessment team, focusing on the quality assurance of monitoring for industrial emissions and ambient air-quality. For the past year, he has been working on options for delivering the industrial aspects of the 2019 Clean Air Strategy, especially for ammonia emissions.

Ben Kite CEcol MCIEEM, Ecological Planning & Research Ltd

Ben is the Managing Director of EPR, an independent ecological consultancy based in Hampshire. He is a Chartered Ecologist and environmental planner, with expertise in Habitats Regulations Assessment and Environmental Impact Assessment. Ben has been responsible for assessing the effects of development-related air pollution on many Natura 2000 sites, including those arising from diffuse traffic and point source emissions on both SACs and SPAs, along with recent air quality related commissions from Natural England. Working at the forefront of air quality assessment for HRA, Ben keeps abreast of the ever-changing requirements emerging from guidance and case law.

Andrew Cross MCIEEM, Ecological Planning & Research Ltd

Andrew is EPR's Senior Botanist and has been a Professional Botanist for over 20 years, surveying many sites across the UK in coastal, lowland and upland settings. He is one of a team responsible for producing detailed vegetation maps for many of the designated heathland sites in the Thames Basin Heaths and Wealden Heaths. In addition to surveying vegetation and flora, Andy also studies lichens including looking at old growth woodlands and heathland habitats. Over the years he has developed his expertise in interpreting landscape history, including that of the New Forest which he lives on the doorstep of and regularly botanises in.

Abstracts

Dutch Disaster. Or: How to Prevent Significant Effects of Nitrogen Deposition on Nature (and Politics)

Dick Bal, Dutch Ministry of Agriculture, Nature and Food Quality

The Dutch 'Integrated Programmatic Approach to Nitrogen' (2015) was designed in such a way that it would be the right answer to the strict protection of Natura 2000 sites as required by the Habitats Directive. It provided - among other things - an appropriate assessment for all Natura sites. It is believed to be the strictest implementation of the Habitats Directive to date, but not strict enough according to the European Court of Justice and the Dutch Council of State. This led to a political crisis in The Netherlands. Dick Bal will point out some lessons learned and will give an update of the difficult situation with regard to permit procedures (how to

avoid significant effects in combination with other projects?) and the need for drastic nitrogen emission measures.

Air Quality & HRA: De minimis Caselaw

Penny Simpson, Freeths

Review of recent case law on the concept of de minimis air quality impacts on European sites.

Air Quality Assessments Under the Habitats Regulations – The Importance of a Site’s Conservation Objectives and Why we Need to Agree a Robust Approach to the Setting of *De minimis* Values

Caroline Chapman MCIEEM, DTA Ecology

Air quality assessments under the Habitats Regulations are complicated by a number of factors. Recent case law decisions have established that the blind application of generic *de minimis* thresholds, which cannot be supported on logical or empirical grounds, is not consistent with the requirements of the Habitats Regulations. This talk will explore these decisions, in light of other case law, and consider how we should review and amend our assessment approaches to ensure sufficient protection to designated sites whilst avoiding legislative overkill.

How do we Ensure Better Consistency Within Habitats Regulations Assessment (HRA) Across Local Authorities Whose Development/Forecast Growth May Affect the Same Habitats Sites?

Joanna Rochfort & Owen Peat MCIEEM

Joanna and Owen will outline her experiences working on HRA’s for Plans and Projects within the vicinity of Thames Basin Heaths Special Protection Area (SPA). In particular, they will discuss the challenges associated with assessing ‘in-combination’ effects and how we can improve consistency between HRA’s undertaken for Plans and Projects within the same region, whose ‘in-combination’ effects should be the same. They will draw on her experiences working for Bracknell Forest Council (BFC) and Wokingham Borough Council (WBC) including challenges obtaining a robust traffic dataset for roads outside of BFC and WBC’s administrative boundary (where they lie within 200m of a Habitats Site) and challenges forecasting growth in the Region between now and 2036 (the end of BFC’s emerging Local Plan period), including the likely future composition of the vehicle fleet.

Joanna and Owen will also discuss the benefits of the technical working group established between WSP, Stantec and Air Quality Consultants in order to improve consistency between the HRA’s being undertaken for Bracknell and Wokingham emerging Local Plans and a major development scheme within Wokingham. The working group has been used to discuss and agree the assessment methodologies being applied with respect to air quality, including various parameters used as inputs into detailed dispersion modelling.

NOx and Ammonia from Road Traffic – Some Inconvenient Truths

Dr Ben Marner, Air Quality Consultants Ltd

The presentation will also consider some of the other key limitations with common approaches used to assess air quality impacts on designated sites which, while supported by published guidance, are not consistent with current evidence.

Air quality assessments of traffic emissions consider emissions of nitrogen oxides (NOx) but frequently ignore ammonia (NH₃); which is produced as a by-product of emissions controls for NOx. The presentation will show that Defra’s published emissions factors for ammonia are likely to be too low and that, in practice, ammonia emissions from road vehicles can contribute more than half of the total contribution of traffic emissions to nitrogen deposition. It will be shown that, by ignoring traffic-related ammonia, or by relying on official emissions

forecasts, current deposition rates will be under-predicted while the rate of improvement going forward will be over-predicted.

AmmoniaN2K: Improving Environmental Assessments for Atmospheric Ammonia

Dr David Kelleghan gradCIEEM, University College Dublin

Dr. Kelleghan will give insights into his research in Ireland, which has focused on ecological impacts of atmospheric ammonia. Through a combination of monitoring and modelling he strives to improve our understanding of associated impacts and the risk posed to Natura 2000 sites. Based on his research he has developed a number of recommendations he believes should be integrated into environmental assessments, ensuring adequate protection in the future.

Spatial Targeting of Mitigation for Effective Reduction of Atmospheric Nitrogen Input to Sensitive Habitats and Designated Nature Conservation Sites

Dr. Ulli Dragosits, UK Centre for Ecology & Hydrology (UKCEH)

Ulli will briefly illustrate the effects of atmospheric nitrogen pollution on terrestrial ecosystems and outline the main sources and key mitigation options. Atmospheric ammonia, mainly originating from agricultural activities, is highly reactive and much of its impact occurs close to emission sources, e.g. slurries and manures from livestock farming and mineral fertiliser applications. She will then use case studies from across the UK, at a landscape and regional scale, to lay out the concept of spatial targeting of mitigation for designated sites. These studies have shown that, if mitigation measures are spatially targeted where they provide the most benefit, much larger reductions in local atmospheric N input to receptors can be achieved than with the same amount of emission reduction spread more evenly across the country. Case studies include designated sites from a portfolio of projects for Defra, Daera, NRW, NIEA, JNCC and Natural England.

Can Semi - Natural Habitats Recover from Atmospheric Nitrogen Deposition?

Dr Carly Stevens, Lancaster University

Atmospheric nitrogen deposition is a considerable threat to plant biodiversity globally. Many experimental nitrogen additions and studies using gradients of ambient deposition have demonstrated impacts on the plant species richness, diversity and composition in a broad range of habitats. In the last two decades levels of nitrogen deposition have begun to decline in some parts of Europe but it is currently difficult to assess the extent to which reductions in N deposition will result in recovery within semi-natural habitats.

There have been a number of experimental investigations of how habitats can recovery after N addition ceases. I will collates evidence from experiments where N additions have ceased or where nitrogen inputs have been reduced to assess how likely it is that habitats will recover from nitrogen deposition, timescales for recovery and factors that might influence whether a habitat will recover. Several studies over long periods of time indicate that without active restoration recovery may be very slow or may not occur. Vegetation may reach an alternative stable state and without further environmental perturbation, species lost as a consequence of changes due to N deposition may not be able to recolonize. In these cases, only active restoration efforts can restore damaged habitats.

How the Environment Agency Uses Monitoring, Modelling and the Systems Approach when Assessing Potential and Actual Air-quality Impacts

Richard Gould, Ellie Stubbs and Judith Ford, Environment Agency, Environment & Business Directorate, Radioactive Substances and Industry Regulation Division

The Environment Agency regulates thousands of industrial processes that have emissions to air. When assessing permit applications and permit compliance, the Environment Agency uses a systems approach, which includes a range of connected tools for measuring, monitoring and modelling as well as taking into account applicable legislation, notably the Industrial Emissions Directive (2010), the Ambient Air Quality Directive (2008), and the Habitats Directive (1992).

Using an example of an assessment for a permit for an industrial process that could have impacts on habitats, this presentation will describe how the Environment Agency uses a combination of monitoring and modelling tools to assess potential impacts, examining the proposed application (the source), modelling the dispersion of emissions (the pathway) and the potential impacts on a habitat (the receptor). The presentation will also describe current challenges, such as applying case law, thresholds, the 2019 Clean Air Strategy, and addressing the uncertainties in modelling processes.

The Confounded and the Confounding: A Case Study into Air Quality and the Heathlands of Hampshire's New Forest

Ben Kite CEcol MCIEEM & Andrew Cross MCIEEM, Ecological Planning & Research Ltd

Assessing the potential effects of changes in air quality associated with planned development can be extremely challenging. An ecologist working in this area is required to understand the scale of development and the predicted changes in air quality associated with that development. Relevant environmental benchmarks must be applied, with the results framed within the context of an existing baseline. EPR was tasked with examining the implications of the proposed Local Plan development on the New Forest's designated features.

To understand the risk of future adverse effects on site integrity, it was necessary as part of understanding the baseline to examine the nature of any patterns and processes arising from historic and modern land use and management, a task that was complicated by the New Forest's diverse geography and varied management. Carefully designed fieldwork investigations were completed, aimed at detecting potential signals of existing air pollution effects on vegetation, and in turn designated site features. The results of the study emphasize the importance of understanding site-specific landscape history and, where landscape pattern is concerned, highlight the need to be cautious in interpreting cause and correlation.