

Air Pollution Bulletin

Number 7 - April 2014

JNCC and the country conservation bodies (CCBs) collaborate on air pollution work through the Inter-agency Air Pollution Group (IAPG). The group works together to provide evidence and advice on air pollution impacts on biodiversity and ecosystems.

The CCBs are statutory consultees under planning law and pollution regulation, which involves assessment of air pollution impacts on habitats and species. In addition to the IAPG, the CCBs have formed an informal air pollution casework group to share experience and best practice.

The *Air Pollution Bulletin* provides an overview of the IAPG's and casework group's key activities, with links to further information. It is principally an update for CCB staff, but will also be of interest to other environmental organisations, the research community and the general public. If you have any comments, or would like more details on any of the topics covered, please email [Clare Whitfield](mailto:Clare.Whitfield@jncc.gov.uk).

Since the last *Bulletin* in 2012, JNCC and the CCBs have continued to develop the understanding of air pollution impacts on habitats and species, and on measures to address this. This has involved working closely with [Defra](http://www.defra.gov.uk), the devolved administrations and the UK environment agencies. 2013 was the "European Year of Air" and a new "[Air Quality Package](http://www.europa.eu)" was published setting out the [European Commission's](http://www.europa.eu) ambitions up to 2030. In 2013 reports were published on air pollution impacts on saltmarsh and sand dunes, and a detailed study to look at the role of site management in ameliorating nitrogen deposition. These results will be used to look at site specific measures to reduce nitrogen impacts. The year ended with JNCC hosting the "Nitrogen Deposition and the Nature Directives" European Workshop, promoting knowledge sharing of methods to assess nitrogen impacts and of the practical measures to address these impacts. Details of these topics and other relevant updates are contained in this *Bulletin*.

In this issue:

- **Latest News**

- **Nitrogen Deposition: reporting impacts and reducing impacts**
- **New field guide for assessing effects of atmospheric nitrogen pollution**
 - **Nitrogen Deposition and the Nature Directives Workshop**
 - **Improvement Programme for England's Natura 2000 Sites**
- **European Clean Air Package**
- **Looking ahead - priority work areas**

News...

Updates to the Air Pollution Information System (APIS)

Together with the Environment Agency and the Scottish Environmental Protection Agency (SEPA), JNCC and the CCBs are continuing to update and improve APIS. This website provides information on air pollution and the effects on ecosystems. It is an essential tool for air pollution impact assessment for casework, as well as a source of more general information.



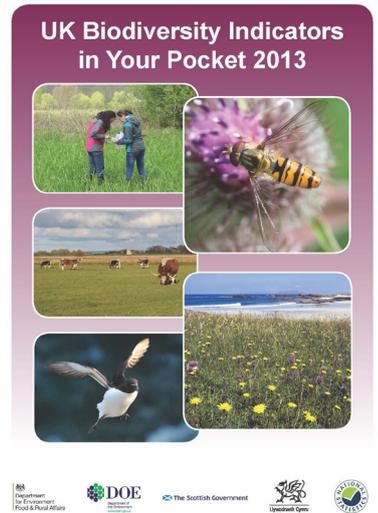
Improvements in 2013 included updates to the pollution data, the habitat/impacts records for nitrogen deposition and the addition of recommended critical load values for casework. Over the next few months there will be further updates to the overview pages and pollution/impact records for ozone and acidity, improved access to species impacts data, the addition of Site Relevant Critical Levels and improvements to the functionality for searching for relevant critical loads for Sites of Special Scientific Interest in England.

Biodiversity Indicators in Your Pocket

In October 2013, JNCC published an update of the UK Biodiversity Indicators in Your Pocket. This suite of indicators includes the pressure from air pollution, based on area of exceedance of critical loads for acidification and eutrophication. The latest results are presented in the table below.

Percentage of area of sensitive UK habitats exceeding critical loads for acidification and eutrophication for average deposition 2009 to 2011

	Acidification (%)	Eutrophication (%)
UK	49	68
England	66	98
Wales	78	92
Scotland	36	48
Northern Ireland	71	92



The indicator also shows the changing trend in area of critical load exceedance since 1996:

- In 1996, acid deposition exceeded critical loads in 73 per cent of the area of sensitive habitats. This declined to 49 per cent in 2010.
- In 2010, nitrogen deposition exceeded critical loads in 68 per cent of sensitive habitats. This was a decrease from a level of 75 per cent in 1996.

European Year of Air 2013

Each year the European Union (EU) dedicates a year of events to mark a particular theme. In 2013 the topic was EU air quality. Despite a range of existing policies the World Health Organisation's air quality guidelines are regularly breached. The economic cost of the health impacts alone is estimated at EUR 330-940 billion (3-9% of EU GDP). In terms of protected sites it is estimated that two thirds of sites designated under the Natura Directives are under threat from air pollution. The main event of the Year of Air was Green Week which focussed on air quality issues. The Year of Air culminated in the publishing of the "Air Quality Package" in December 2013.

News...

Habitats Directive Report 2013

The 3rd UK Habitats Directive Report was submitted to the [European Commission](#) in 2013. The report includes an assessment of the conservation status of the habitats and species listed in the Annexes of the Directive which are present in the UK. An assessment of the pressure and threat from air pollution was undertaken as part of the conservation status assessments for Annex I habitats for the Article 17 report in 2013. The assessment was based on critical loads exceedance for habitats which are sensitive to nitrogen and for which a relevant critical load is established. The results were used alongside site condition data to inform the conclusions of the “structure and function” and “future prospects” parameters used to judge conservation status.

For 34 Annex I habitats, out of a total of 77, air pollution was recorded as a high pressure and high threat.

Please visit the JNCC websites for further information on the [UK Report](#) and for details of the [methodology for the air pollution assessment](#).

Ammonia Emissions damage sensitive habitats upwind of a poultry farm

Work commissioned by the Countryside Council for Wales (now part of Natural Resources Wales) involving the Centre for Ecology and Hydrology (CEH) and Bangor University has shown that ammonia emissions from an intensive poultry unit were detectable up to 3km upwind from the unit and within a Special Area of Conservation (SAC) at Newborough in North Wales. At 800m upwind, emissions from the poultry unit caused exceedance of both the critical level (ammonia) and the critical load (nutrient nitrogen) for the SAC sand dune habitat. Nitrogen loving species such as cocksfoot (*Dactylis glomerata*) and ribwort plantain (*Plantago lanceolata*) showed significant increases in growth as a result of additional nitrogen from the unit and this threatened the integrity of the protected site. As a result of this work, measures have been put in place to reduce emissions from the unit to acceptable levels. The results are being studied closely by NRW with a view to ensuring better understanding of potential upwind impacts in future casework. The results are published in [Environmental Pollution](#). For more information contact [Simon Bareham](#) at NRW.



Newborough Warren Dunes © Alex Brown

Advice on nitrogen deposition impacts on UK saltmarsh habitats



Saltmarsh © Doug Becker

The Countryside Council for Wales (now part of Natural Resources Wales) have published a report of atmospheric nitrogen impacts on saltmarsh habitats. The report is a review of the relative contributions of atmospheric and aqueous sources to UK saltmarshes. The report provides advice on how to apply the nitrogen critical load range (20-30 kgN/ha/year) to different areas of saltmarsh when assessing nitrogen deposition impacts.

Boorman, L.A & Hazelden, J. 2012. *Impacts Of Additional Aerial Inputs Of Nitrogen to Saltmarsh And Transitional Habitats - Science Report No. 995* Countryside Council for Wales, Bangor, Wales.

Nitrogen Deposition: reporting impacts and reducing impacts

In response to the increasing evidence of nitrogen impacts on habitats and species in the UK, JNCC and the CCBs are developing methods for accounting for and attributing nitrogen impacts in reporting of habitat status and site condition. Where possible, the CCBs will then seek to put in place measures to reduce nitrogen impacts to sites.

A methodology for nitrogen assessment for Habitats Directive Article 17 reporting and site-level assessment (SSSI/ASSI) was developed in 2012 based on a pilot habitat (calcareous grassland). This method was used to inform conservation status assessments for the 2013 Article 17 report (see [“page 3”](#)). A Task and Finish Group has been established to apply the approach to other habitats and to provide an implementation plan for incorporating nitrogen deposition impacts assessment into site-level reporting.



Snowdonia © Natural Resources Wales

The Task and Finish Group is chaired and run by JNCC, and made up of members of the CCBs. The group oversees the project which is delivered through two parallel work-streams:

Work Stream 1: Attributing nitrogen impacts as a cause of unfavourable condition.

Work Stream 2: Establishing solutions and mechanisms for implementation (i.e. remedies or actions).

The project plan for the Task and Finish Group and the associated work-streams includes a timetable running from April 2013 until December 2014. At the end of this period, the Task and Finish Group will provide a paper to the Chief Scientist Group providing detailed recommendations for implementation.

The following sections of the bulletin reports on some of the related work which will inform the two work-streams, from topics such as site/habitat assessment through to mitigation of the impacts.

New field guide for assessing effects of atmospheric nitrogen pollution on terrestrial habitats

A new field guide has been published which will enable specialists and non-specialists to determine air quality at a site, with respect to concentrations of ammonia and oxides of nitrogen.

Reactive nitrogen in the atmosphere is a threat to the condition and integrity of many sensitive habitats. Biomonitoring approaches such as this one help to quantify the nitrogen threat more effectively and support site managers in their decision making. As such, the new field guide may be used in investigations of sites where nitrogen pollutants are a potential concern - for example, in investigating the impacts of a point source. Alternatively, where potential issues have been flagged by other monitoring programmes (e.g. site condition assessments) the guide can be used to investigate further.

Guide to using a lichen based index to nitrogen air quality

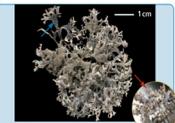
Indicator lichens



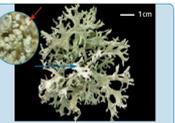
Indicator lichens used in this guide fall into three growth forms:

- 1. Bushy lichen**
Attached to the bark at the base.
Branched and shrub-like, attached to the bark at the base. Branches rounded in section or strap-like with a distinct upper and lower surface.
- 2. Leafy lichen**
Attached to the bark from the lower surface.
Leaf-like lobes closely or loosely attached to the bark from the lower surface.
- 3. Crustose or granular lichen**
Closely attached to the bark and cannot be removed without cutting the bark.

Lobes strap-like in section



Pseudevernia furfuracea Pale grey upper surface, black lower surface ✓ except on young lobes, with numerous pin-like soredia on the upper surface ✓



Evernia prunastri Lobes pale green on the upper surface and whitish on the lower surface ✓, strap-like, flattened, with soredia ✓ present on upper surface of well-developed specimens.

1. Bushy – branched and shrub-like, attached to the bark at the base

FSC

The method uses common, easy to identify lichen species that are found growing on oak and birch trees. These are counted and the number of nitrogen-sensitive species is compared to the number of nitrogen-tolerant species with the result used to calculate an air quality index for a site. This indicates the relative health of a site and its risk of being compromised by atmospheric nitrogen air pollution.

Copies of the eight page laminated field guide have been distributed to the country conservation bodies - please contact the relevant IAPG member. Additional copies can be ordered from the [Field Studies Council](#) for £3 plus postage. A low resolution version can be downloaded from the [APIS website](#). A supporting field manual (including field recording sheets) is currently being produced by the Centre for Ecology and Hydrology. Once completed, this will also be published on the APIS website.

Nitrogen Deposition & the Nature Directives Workshop

Atmospheric nitrogen pollution has been identified as a major pressure to sensitive habitats and species across Europe. Unless it is tackled, nitrogen deposition is likely to present a serious impediment to achieving the aims of European legislation such as the Habitats and Birds Directives. It is a problem that can only be tackled effectively by co-ordinated action across administrative and national boundaries.

This issue was discussed at the Atlantic Region Natura 2000 Seminar in 2012 and in response, in December 2013, JNCC hosted a “[Nitrogen Deposition and the Nature Directives Workshop](#)” on behalf of the UK Government, devolved administrations and the CCBs. JNCC collaborated with the Dutch Ministry for Economic Affairs and the Task Force on Reactive Nitrogen in preparing the workshop.

The workshop brought together leading experts from across the countries of the Atlantic region of Europe, to share knowledge and experience of assessing the impacts of atmospheric nitrogen pollution, and examine countries’ approaches or strategies to reduce impacts on Natura sites and the wider landscape.

Professor Ian Boyd, Chief Scientific Adviser at Defra, provided the opening address. This was followed by a series of presentations from guest speakers from the [European Commission](#), [European Topic Centre for Biological Diversity](#) and from expert groups from the [Convention on Long-Range Transboundary Air Pollution](#). Detailed discussions were then held in working groups which examined specific topics in greater detail.

The workshop was very well received: participants welcomed the opportunity to exchange information and best practice between experts, and to make contacts for future collaboration. An emerging theme was the need to continue sharing good practice across a range of measures to reduce nitrogen impacts, and an increased awareness across not only the conservation community but the main source sectors, such as agriculture, the non-governmental organisation (NGO) community and the general public more widely.

A report of the workshop will be published in spring 2014. It will record the conclusions and recommendations, including where follow up work was suggested, and a description of countries’ approaches to assessing and tackling impacts from nitrogen pollution. The IAPG will then plan any follow-up action required.

Is habitat management effective at reducing atmospheric nitrogen deposition impacts?

Given the extent of nitrogen impacts across semi-natural habitats in the UK, it is important to understand how habitat management measures can reduce nitrogen deposition impacts and promote recovery, alongside measures to control releases of nitrogen pollutants.

A study funded by a consortium of partners (the Countryside Council for Wales (now Natural Resources Wales), Natural England, the Northern Ireland Environment Agency and Scottish Natural Heritage, with support from JNCC) reviewed the effectiveness of current “on-site” land management methods to assess what effect management methods are having on habitat response to nitrogen deposition. This study considered woodland, neutral grassland, calcareous grassland, acid grassland, dwarf shrub heath, bog and coastal habitats and also considered the potential synergy with climate change impacts. It makes recommendations for realistic and practical measures for different habitat types which could be further explored to mitigate nitrogen deposition impacts and promote recovery.

The study concluded that current management practices may already be partially offsetting the impacts of nitrogen deposition and will not undermine the resilience of habitats under climate change. However, the study also concluded that habitat management alone will not address the issue and effective emission control is required alongside on-site measures.

The study is part of a programme of ongoing work by the CCBs to better evaluate and address the implications of nitrogen deposition to habitats of conservation interest ([see “page 4”](#)).

The report includes recommendations on how this work could be developed through a series of on-site practical field trials. The full report can be found on the [JNCC website](#).



© Martin Sherry



© Hilary Kehoe/ AGAP



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Images show Nutrient Stripping by NRW working with conservation partners to restore gorse-dominated rank heathlands.

Improvement Programme for England's Natura 2000 Sites (IPENS)

IPENS, supported by European LIFE+ funding, is enabling Natural England, the Environment Agency, and other key partners to plan what, how, where and when to target their efforts on Natura 2000 sites and the areas surrounding them.

By 2015 the programme will:

- Develop a Strategic Framework for the future management of Natura 2000 sites.
- Develop Theme Plans to address issues that affect multiple Natura 2000 sites.
- Produce a Site Improvement Plan for each Natura 2000 site. The intention is, for water dependent Natura 2000 sites, that these will be integrated into the updated second round of River Basin Management Plans under the Water Framework Directive during 2014.
- Identify and, where possible, plug gaps in our Natura 2000 evidence.



Salisbury Plain © Gerd Evermann

This will be the first time that this information will have been drawn together for all of England's Natura 2000 sites.

Site Improvement Plans

Site Improvement Plans will focus on the priority issues affecting the European features and the actions required to improve their condition. The Plans will set out which mechanisms (i.e. actions and measures) could be used to address these priority issues, how much it will cost and where the money could come from. The project will work with key stakeholders to identify the best solutions and agree who will take these forward.

Theme Plans

A suite of Theme Plans is being developed to address issues that impact on, and affect the condition of, multiple Natura 2000 sites which are difficult to resolve on a site-by-site basis. The impact of nitrogen deposition has been recognised as an issue that requires a more strategic national approach. The Theme Plan for nitrogen deposition will be developed in spring 2014, drawing on input and experience from experts, partners and national stakeholders.

European Clean Air Package

To mark the end of the “Year of Air” the European Commission published a European Clean Air Package on 18 December, 2013. This was made up of four main components:

• A Clean Air programme for Europe

The programme announced supersedes the existing 2005 Thematic Strategy for Air Pollution (TSAP) and provides a strategic framework for air quality policy until 2030. This is a “high level” commission communication stating overall ambition. As such it is not a negotiable position, although other elements of the package will require sign off by member states.

• National Emission Ceilings Directive (NECD)

The current proposal would repeal and replace the existing 2001 NECD. It will set new emission ceilings (emission allowances) for sulphur dioxide, ammonia and non-methane volatile organic compounds for 2020 and 2030. It will also extend the provisions of the Directive to cover emissions of small particulate matter (PM2.5) from 2020 and methane from 2030. The ceilings for 2020 reflect the levels already agreed by member states under the Gothenburg Protocol. For example, the proposal states that compared to a 2005 baseline the UK will have to achieve a 55% reduction in emissions of oxides of nitrogen by 2020 and a 73% reduction by 2030. For ammonia, it is proposed that the UK will have to deliver an 8% reduction by 2020 (compared to 2005) and a 21% reduction by 2030. The NECD claims that by 2030 the new ceilings will result in an 85% fall in the extent of acidification with a more moderate (35%) reduction in the extent of eutrophication, compared to 2005. The NECD proposal contains, in Annex III, a list of measures that Member States should consider to control ammonia emissions.

Member States will be required to produce National Emission reduction plans to set out how they plan to achieve the ceilings and these plans will need to be updated every two years.

• A Proposal for a Directive on Medium sized Combustion Plant

This proposal is intended to bridge the gap between the Eco-design Directive, which regulates emissions from combustion plants under 1 Megawatt (MW) and the Industrial Emissions Directive (IED) which regulates combustion plants greater than 50MW. The majority of medium sized plants are likely to be small power station units for domestic or industrial properties. It is hoped to transpose the Directive in 2018/19. Existing plant greater than 5MW would have to register for inclusion in 2025 and units under 5MW by 2030.

• Gothenburg Protocol

The Air Quality Package also includes a recommendation to ratify, on behalf of the EU, the amendments to the Gothenburg protocol agreed in 2012. The EU is party to the Protocol which sets limits on the EU overall as well as individual parties to the convention. Once ratified it will become EU law and will be delivered via a range of measures such as the NECD, IED and proposals for a Directive on medium sized combustion plant.

Looking ahead - priority work areas

The main focus of the IAPG over the following year includes:

- Continuing provision of evidence and advice, including in support of the UK government's and Devolved Administrations' policy response to the EU Air Quality Package.
- Continuing to work with Defra and other agencies to explore opportunities to reduce/capture atmospheric ammonia emissions as part of the development of the new Rural Development Programme under the Common Agricultural Policy (CAP) (Natural England lead).
- Managing the inter-agency Task and Finish Group for nitrogen impacts.
- Publishing the report of the "Nitrogen Deposition and the Nature Directives Workshop", and plan any follow up response.
- Overseeing the APIS project and ensuring it is updated and enhanced as necessary.

Further details of the IAPG work plan can be obtained from [Clare Whitfield](#). Details of the casework group work plan can be obtained from [Mike Shepherd](#).

Membership of the IAPG

The IAPG involves specialist staff from the four UK CCBs and JNCC.

- **JNCC** – Dr Clare Whitfield
- **Natural England** – Dr Zoe Russell and Gordon Wyatt
- **Northern Ireland Environment Agency** – Keith Finegan
- **Natural Resources Wales** – Simon Bareham and Khalid Aazem
- **Scottish Natural Heritage** – Alison Lee (IAPG) and Mike Shepherd (casework group)

