Air Pollution Bulletin Number 3
October 2005

News from the Air Pollution Lead Co-ordination Network (APLCN)

The APLCN was established in 2000 to assist JNCC and the UK statutory conservation agencies with their air pollution work. The APLCN produces technical and operational advice for conservation agency staff; provides strategic advice on air pollution impacts on nature conservation to a wide constituency; develops air pollution policy; and manages air pollution research projects.

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1. Introduction

The Air Pollution Bulletin provides information on the APLCN's current activities. Produced every year, it is an update for conservation agency staff, but we hope it is also of interest to other environmental organisations, the research community and the general public. We welcome feedback on its format and content. If you have any comments, or would like more details on any of the topics covered, email the network officer clare.whitfield@jncc.gov.uk.

2. Membership of the Network

The APLCN involves specialist staff from the three country conservation agencies, JNCC and the Environment and Heritage Service Northern Ireland (EHS).

Network Chair - Simon Bareham - Countryside Council for Wales
Network Officer - Dr Clare Whitfield - Joint Nature Conservation Committee
Other members - Dr Noranne Ellis - Scottish Natural Heritage; Dr Caroline Chapman - English Nature; Dr Zoe Masters - English Nature; Andrew McIntosh - Environment and Heritage Service, Northern Ireland

Clare Whitfield commences maternity leave in mid-December and backfill for the post is currently being arranged.

3. News

- **New publications**

Monitoring impacts of air pollution – a scoping study

A scoping study to recommend options for the monitoring of nitrogen, ozone and acidification impacts on terrestrial habitats in the UK can be downloaded at

http://www.jncc.gov.uk/pdf/airpollution_impactsscopingstudyreportfinal.pdf. It was undertaken by CEH and partners, and funded by Defra, the Environment Agency, JNCC and the country agencies. The main objectives of the study were:-

- To review existing monitoring and surveillance activities;
- To recommend potential frameworks for a network; and
- To identify potential mechanisms for operation and delivery of results.

A follow up project is being undertaken with the objective to design and cost the targeted monitoring of both climate change and air pollution impacts on biodiversity. See Section 6 for more details.

Atmospheric nitrogen pollution impacts on biodiversity: Phase 1 - model development and testing

This project developed and tested dynamic models for predicting the impact of nitrogen deposition on the vegetation of a selection of Biodiversity Action Plan priority habitats. The aim was to produce a modelling capability that could test the impact of multiple drivers on priority habitat patches and, in particular, Common Standards Monitoring (CSM) attributes.

The project was principally funded by Defra, with contributions from English Nature and JNCC. A copy of the report is available at http://www.jncc.gov.uk/page-1426.

Nitrogen biomonitoring methods - Phase 2

Following publication, last year, of a review and evaluation of biological monitoring methods for assessing the effects of nitrogen on habitats (JNCC Report 356), a follow up project has been undertaken. This 'Phase 2 project' included a refinement and further testing of the 'best' methods identified in the first phase of the work. Methods were tested at four 'intensive' sites and at 32 'extensive' sites across the UK, alongside measurements of atmospheric nitrogen concentration and/or deposition.

The project was funded by JNCC, the country conservation agencies and SNIFFER. A workshop was held in June to disseminate the results to the agencies and discuss the next steps towards implementation of biomonitoring within a regulatory framework or site assessment.

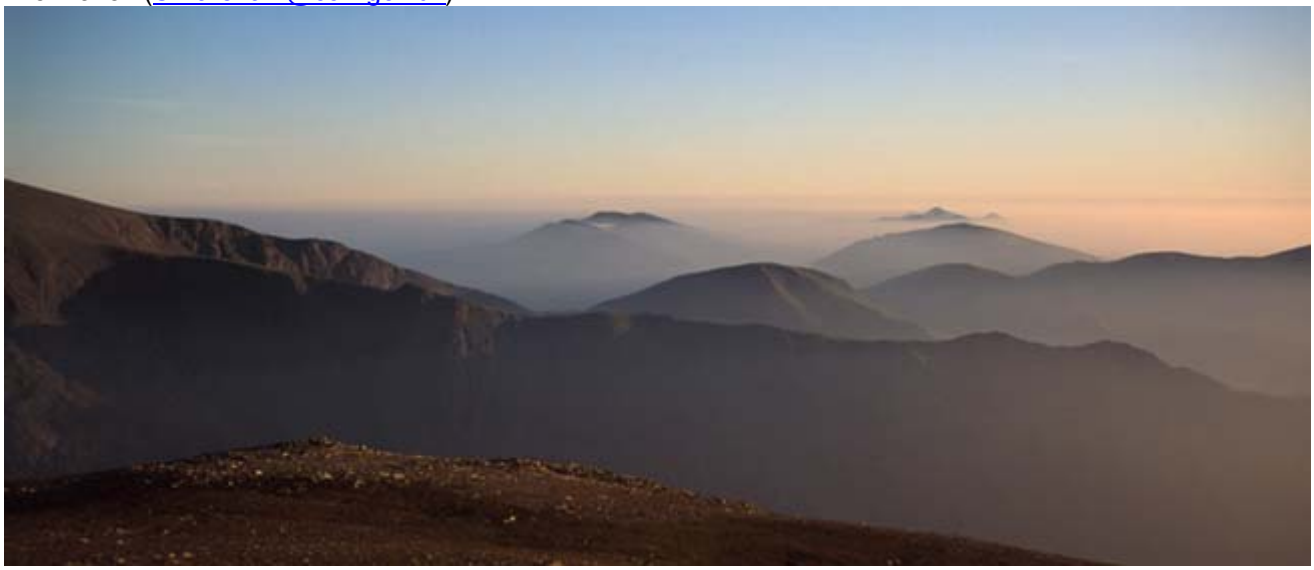
The results and recommendations will be published early in the New Year as a JNCC Report which will be available from our website (www.jncc.gov.uk).

Determining a nitrogen budget for Merthyr Mawr sand dune system. CCW review of consents report number 14

A study to quantify nitrogen inputs from different sources and pathways to a South Wales SAC.
A key finding is that although a site may not exceed the critical load from atmospheric inputs if you add in additional inputs such as those associated with ground water you may well have exceedence. Contact Rod Jones at CCW for further details (R.Jones@ccw.gov.uk).

Site characterisation of Snowdonia

Snowdonia Special Area of Conservation was identified as an ideal area to assess the impacts of long-range air pollution. CCW and Environment Agency Wales have funded a project to create three data catalogues covering environmental pressures and the sensitivity of terrestrial and aquatic habitats to those pressures. The work pulls together all relevant existing data from previous studies and surveys and allows for an 'in combination' assessment under the Review of Consents. Contact Simon Bareham for further information (S.Bareham@ccw.gov.uk).



Photochemical haze at Snowdonia National Park. Photograph by Prof. John Farrar, University of Wales, Bangor.

- **Streamlining European Biodiversity Indicators (SEBI2010)**

Under the auspices of the Convention on Biological Diversity, a major pan- European programme of work is currently being undertaken to ensure coordination of the development and implementation of indicators for assessing, reporting on and communicating progress towards the 2010 target to reduce the rate of biodiversity loss. Simon Bareham has been appointed Chair of an expert group tasked with producing a nitrogen deposition indicator. Simon is also providing input to the development of a nitrogen indicator within the parallel UKBAP indicator framework.
See http://biodiversity-chm.eea.eu.int/information/indicator/F1090245995/F1115189656 for further information or contact Simon (S.Bareham@ccw.gov.uk).

- **Air Quality Technical Advisory Group (AQTAG)**

The joint Environment Agency, English Nature and CCW AQTAG was established in 2000 by the Agency's Habitats Directive Project to provide technical guidance on the assessment of air emissions from IPC/IPPC processes as part of the Environment Agency's review of consents and the issuing of new permissions. The APLCN provides technical support to English Nature and CCW on the TAG.

In 2005, a subgroup of the AQTAG was established to progress work on the development of guidance and the identification of R&D requirements for the assessment of ammonia impacts. The main focus is on releases from PPC intensive agriculture installations which have to be permitted under the PPC Regulations by 2007. The group has produced a log of recent research projects and monitoring carried out by the agencies; a log of recent cases (in order to share good practice and experience) and a gap analysis which will form the basis of the group's work programme. These papers will be placed on the review of consents pages of English Nature's and CCW's intranet sites in the next few months and can be made available on request to SNH and EHS staff. Guidance is currently being produced by the group, which will also be made available when completed. This includes a simple screening tool for ammonia deposition and a worked example for ammonia impact assessment which are being produced by the Agency's Air Quality Modelling and Assessment Unit.

- **Review of the Air Quality Strategy**

Defra is currently reviewing the Government's Air Quality Strategy (AQS) for the UK. A public consultation will be held towards the end of this year/early next year (http://www.defra.gov.uk/environment/airquality/forum/). The AQS provides standards or objectives for nine key air pollutants which should be met by certain dates. Local Authorities have to undertake a review and assessment of air quality in their area to ascertain if they will achieve these standards, and where not, declare an Air Quality Management Area (AQMA). The majority of AQMAs are in respect of the objectives for nitrogen dioxide and particulates (PM_{10}). Road traffic emissions are the main source in 95% of the AQMAs and only a few have been designated as a result of industrial sources. The majority of AQMAs in Northern Ireland have been designated as a result of domestic emissions.

The AQS includes two national objectives for protection of vegetation and ecosystems for oxides of nitrogen (NOx) and sulphur dioxide (SO_2). However, these only need to be met in areas >5km from a motorway, Part A process, urban area or >20km from a major urban conurbation (>200,000 population). We have termed these areas 'exclusion zones' because the ecosystem objectives (which are more stringent the equivalent human health standard) do not have to be met. Where there are sensitive protected nature conservation sites this could lead to adverse air pollution impacts and is in conflict with Government nature conservation policy and legislative requirements.

Therefore, JNCC, on behalf of the UK country conservation agencies, has been in regular correspondence with Defra concerning the review of the strategy over the last few years. JNCC has consistently advocated that the strategy should include a stronger element on ecosystem protection, in line with Government policy objectives and legislative commitments for nature conservation. Specifically, we have recommended that the 'exclusion zones' for current SO_2 and NOx ecosystem and vegetation objectives should not apply where there are sensitive protected sites; and that the AQS should include some consideration of deposition of pollutants and critical load exceedance as well as the inclusion of ammonia.

It is notable, that critical load exceedance is now included within the headline indicators for the UK Sustainability Strategy and is being considered in the context of indicators for the UK BAP.

- New guidance

Guidance for undertaking environmental assessment of air quality for sensitive ecosystems in internationally designated nature conservation sites and SSSIs (Supplement to DMRB 11.3.1). Interim advice note 61/04

The local impacts of air pollution from road transport is potentially of concern within a few hundred metres of a major road. Any impact assessment for road developments must consider the impacts of air pollution on sensitive protected sites, in addition to other impacts on biodiversity. However, existing guidance on air quality assessment of road schemes, as part of the Highways Agency's Design Manual on Roads and Bridges (DMRB) did not adequately address potential air pollution impacts on semi-natural ecosystems and, in particular, the requirements of the Habitats Regulations. Therefore, on behalf of English Nature, the APLCN has worked with the Highways Agency to produce interim guidance as a supplement to the DMRB, which can be found at
(http://www.archive2.official-documents.co.uk/document/deps/ha/ians/pdfs/ian61.pdf)

The guidance applies to England only, but has been sent to the devolved administrations and has so far been adopted by the Welsh Assembly Government. For information on the local effects of air pollution from road transport see English Nature Research Report 580, The Ecological Effects of Diffuse Air Pollution from Road Transport.

Airports guidance

The Government's White Paper on Air Transport, published in 2004, proposed a substantial expansion of airport capacity in England. As a result, to help with an expected substantial increase in related casework, English Nature has issued an Aviation Toolkit for area team staff. This includes an interim internal guidance note on the assessment of local air quality impacts on nature conservation from airport development, which was produced in collaboration with the APLCN. The guidance is interim since there is currently little casework history on emissions from airports and the consequent local effects. Therefore, we will refine screening criteria and the approach in the light of casework experience. A copy of the guidance has been provided to English Nature Area teams and it is also on their intranet site. The guidance can be made available to CCW, SNH and EHS staff on request – contact clare.whitfield@jncc.gov.uk or zoe.masters@english-nature.org.uk.

Ammonia casework advice note

This advice note, produced by the APLCN towards the end of last year, has been issued to staff to raise awareness of the impacts of atmospheric ammonia and to provide details of information and sources of advice to support area teams' casework. It is available on the country agencies' intranet sites or contact clare.whitfield@jncc.gov.uk or the air quality lead in your agency for details.

General Guidance on IPPC

A reminder that the IPPC Information Pack (V3) produced last year by English Nature, CCW and the APLCN, provides a quick reference guide to IPPC and LAPPC, sources of information and advice in the agencies, and summary guidance on the assessment of impacts from discharges to air, land and water. Sector specific and technical guidance notes have also been produced by the AQTAG and are issued by the review of consents projects in English Nature and CCW.

4. Air pollution impacts and site assessment

In our last Bulletin (No. 2. October 2004), we reported on our work assessing impacts of air pollution on protected sites. This continues to be an important theme of the APLCN's work programme. There is a paucity of information on the impacts of air pollution on semi-natural habitats, particularly in relation to the UK's legislative and policy commitments for biodiversity. The conservation agencies' common standards monitoring is not aimed at the assessment of air pollution impacts. Consequently the impacts may be under reported as a reason for unfavourable condition. Furthermore, CSM represents a 'snap-shot' in time and does not incorporate a predictive assessment of future impacts. However, the assessment of impacts and the attribution of air pollution as a contributory cause of unfavourable condition of SSSIs is extremely challenging. Often, air pollution effects will be as a result of complex interactions with other abiotic or biotic stresses, for example climate and grazing. In addition, the impacts of chronic exposure to air pollution may take many years to manifest. Conversely, on some sites, soils and habitats may already be affected by historical pollution.

The APLCN proposes that this is addressed by:-

- the implementation of targeted monitoring on a subset of sites for the purposes of detecting and, as far as possible, attributing air pollution impacts (see section 6 below).
- the inclusion of a judgement of the 'risk' from air pollution, alongside the condition assessment reporting categories.

We are also aiming to run a project in 2006/07 to recommend the potential for attributing nitrogen deposition as a cause of unfavourable condition within the CSM framework, using the key indicator species.

In addition, our work next year will also begin to consider how air pollution impacts can be taken into account of in the assessments of Favourable Conservation Status under the Habitats Directive. Currently, case study examples are being drafted by the Habitats Team at JNCC in order to develop the approach.

5. IPPC and power stations

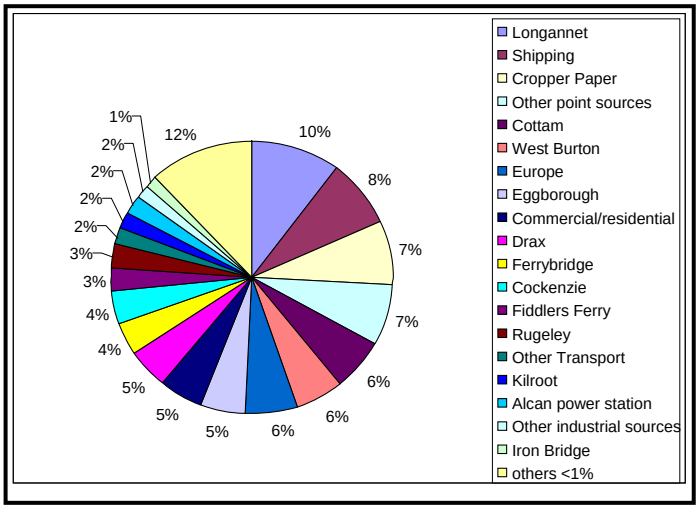
The PPC application window for the large combustion plant sector falls between January and March 2006. The country agencies are statutory consultees under the PPC regime. In addition, the application for a PPC permit is a new 'plan or project' under the Habitats Regulations, so the regulators (Environment Agency, SEPA and EHS) will need to make a judgement of whether the installations are likely to have a significant effect on a European site, and if so, undertake an appropriate assessment.

The sector includes the UK's coal and oil-fired power stations. Historically, these have been major sources of sulphur emissions and contributed significantly to acid deposition. More recently, there has been a decline in the number of coal and oil-fired power stations, because of a switch to gas, and tougher pollution controls have led to significant reductions in emissions. Further declines in emissions are required under EU legislation, such as the revised Large Combustion Plant Directive (LCPD).

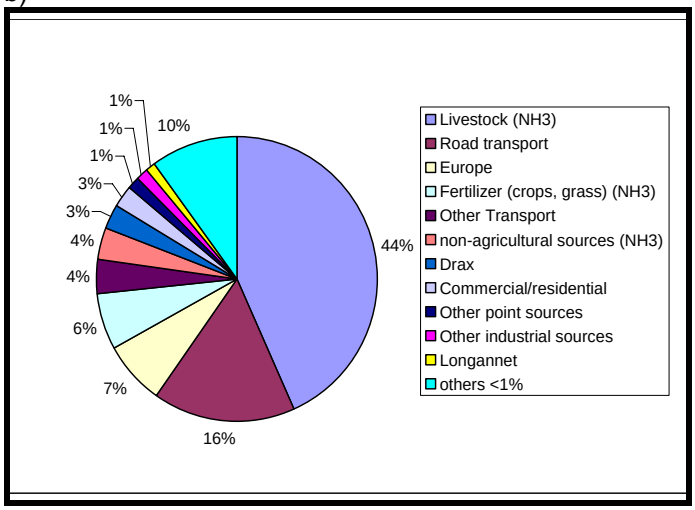
Because of the potential significance of the sector, the Environment Agency and the Joint Environment Programme (JEP) of the Electricity Supply Industry have established a working group to oversee a national assessment of acidity and nutrient nitrogen impacts on European sites in Great Britain. English Nature and CCW are directly involved with this working group and are provided with technical support by the APLCN. This national assessment will be included as part of an assessment package provided with the PPC application for each power station. It will enable individual stations to be assessed, and also integrated in such a way as to address the 'in combination' requirements of the regulations. Future reductions required under LCPD will be accounted for.

The assessment is underpinned by the use of 'site relevant critical loads' and estimates of acidic and nutrient nitrogen deposition modelled for current emissions and for 2010 scenarios. This work has been undertaken by CEH under contract to the Environment Agency and SNIFFER. They have provided a database allocating the 'relevant' critical loads to all sensitive European interest features on all European sites in the UK. Specialists in the country agencies and JNCC were consulted in the development of the database. CEH have also modelled deposition to each interest feature at each site to provide an estimate of critical load exceedance. The total deposition inputs are apportioned by the model to between about 100 sources – the major emitters/sources in the UK, including industry, agriculture and transport. An illustration of the source attribution outputs is given below:

a)



b)



Illustrative example of source attribution for a SAC in northern England a) wet SOy deposition b) wet NHx and NOy deposition.

Over the next six months, this data will be made available on the Air Pollution Information System (www.apis.ac.uk). In the meantime, contact your review of consents teams, or your air quality lead contact, for details.

Timetable for Action:
Since the country agencies are statutory consultees they should expect formal consultation on the applications from March onwards. This includes not only the coal and oil fired power station but other combustion plant (estimates is about 250 applications). However, prior to that there are likely to be requests for information and ground-truthing of data for the national assessment by JEP. Further details and guidance will be supplied by your review of consents team or your air pollution lead contact.

6. Research update

A list of the projects the network is currently involved in is provided below:-

- **Assessing the risks of air pollution impacts to the condition of Areas/Sites of Special Scientific Interest in the UK.** Funded by English Nature and JNCC. The objective is to critically evaluate options for assessing the risks to terrestrial SSSIs and their notified interest features from air pollution, based on the concept of critical loads/levels exceedance, and to recommend the option(s) most fit for purpose. The reporting of risk from air pollution impacts on SSSIs/features is to support the conservation agencies' reporting on the condition of sites/features to ensure the potential effects of air pollution are highlighted in order to inform policy advice. Therefore, the various approaches for assessing risk, based on the critical loads/level concept, will be evaluated in the context of whether they add value to current data produced for national mapping of critical load exceedance or the Environment Agency/SNIFFER site relevant critical loads project.

- **Targeted monitoring of atmospheric pollution and climate change impacts on biodiversity.** Funded by Defra, CCW and English Nature, the overall aim of this project is to design and cost a network of sites to monitor the impacts of atmospheric pollution and climate change on biodiversity which will be an extension of the UK Environmental Change Network. The contractor will work closely with a multi-agency partnership to develop a plan which can be funded and implemented over a five year period, following the end of the present contract in March 2006.

- **Air Pollution Information System (APIS).** Supporting and co-ordinating the ongoing maintenance of this web-based database of air pollution information in collaboration with SNIFFER on behalf of the project funders CCW, English Nature, SNIFFER, SNH, JNCC and CEH. See www.apis.ac.uk

- **PhD studentship to investigate the impacts of atmospheric pollution on vegetation at Epping Forest (2003-2006).** Principle funding organisations and lead: Corporation of London and Environment Agency, with contributions from English Nature and JNCC.

7. Looking ahead – priority work areas

The main focus of the network over the follow year will be:-

- Providing technical support to the country agencies on air pollution impact assessment. In particular, concerning the coal and oil-fired power stations and the joint preparation of guidance with the environment agencies and country agencies to facilitate good practice and a common approach.
- Development of a risk assessment approach for reporting alongside condition assessment for SSSIs and subsequent consultation with monitoring specialists in the agencies.
- Advising on how to account for air pollution impacts in relation to reporting on Favourable Conservation Status.
- Supporting Defra and the country agencies on the development of the design of the air pollution and climate change impacts monitoring network and proposed subsequent implementation project.
- Continuing to Chair the nitrogen deposition expert group for SEBI2010 including the consideration of data to support the indicator and relationship to the full nutrient cycle and nutrient management.
- Responding to government consultations including the review of the AQS.

Further details of the APLCN's work programme can be obtained from clare.whitfield@jncc.gov.uk.