



Free Public Lecture Series, Spring 2009

**‘WATER! From Source to the Sea’
Freshwater habitat issues in the UK**

Birkbeck, University of London

in conjunction with the

Ecology and Conservation Studies Society

Water is the basis of all life, yet now its quality for all habitats is compromised by human activities. As a result, climate change threatens increased quality and supply problems, and more flooding, with profound impacts on wildlife and people. This series examines water ecosystems and habitats from London to the national level, their degradation, restoration and management, the challenge of new legislation to deal with new problems, and perhaps some positive solutions.

Join the debate. All welcome. Booking essential.

The lectures will be held in Birkbeck, University of London, WC1

E-mail: environmentevents@FLL.bbk.ac.uk for booking and venue details, (telephone 020 7679 1069)

All lectures are from 6.30pm to 8.30 pm on the following Fridays. Doors open at 6.00pm.

- 13 February ‘The state of river ecosystems: a degraded past, an uncertain future?’
Professor Steve Ormerod, Professor of Ecology, Cardiff School of Biosciences**
- 20 February ‘Water management for nature conservation: conflicts and synergies’
Professor David Gowing, Department of Biological Sciences, The Open University**
- 27 February ‘Getting on with the job: taking practical action for freshwater ecology and conservation’
Dr Raul Raven, Head of Conservation and Ecology, Environment Agency, Bristol**
- 6 March ‘Freshwater nature conservation and pollution: how important is it, and what can we do about it?’
Dr Alastair Burn, Principal Specialist, Freshwater and Pollution, Natural England**
- 13 March ‘Does Climate Change pose a Threat to our Freshwater Ecosystems?’
Professor Rick Battarbee, Emeritus Professor of Environmental Change, University College London**
- 20 March ‘The Future of Freshwaters: lessons from the Merchant of Venice. Have we backed the wrong horses in our conventional approaches to conservation and in the very nature of our society?’
Professor Brian Moss, School of Biological Sciences, University of Liverpool**

The Ecology and Conservation Studies Society welcomes new members. Details of the Society and application forms will be available at the door, and are on our website at:

<http://www.bbk.ac.uk/ce/environment/ecssociety/>

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Notes on the Contributors and their Lectures

13 February ‘The state of river ecosystems: a degraded past, an uncertain future?’

Steve Ormerod is Professor of Ecology, Cardiff School of Biosciences. He is also President of the Institute of Ecology and Environmental Management, Chairman of RSPB Wales, Trustee of the RSPB, Trustee of Association of Rivers' Trusts, Trustee of South East Wales Rivers Trust

With over 25 years experience and over 220 scientific publications, Steve is one of Europe's leading freshwater ecologists. His work focuses on large-scale, multi-disciplinary problems affecting freshwater biodiversity, ecosystem quality and function, and he is known best for flagship studies on the effects of acid rain, land use and climate-change on aquatic insects and river birds.

Landmark studies have included some of the first field-validated models of the ecological effects of acid rain, land use and climate change on river organisms. His group were among the first to develop biological indicators of river acidification and provided the world's first evidence that birds could be affected. Investigations continue to address the problems of acid episodes in headwaters, the ecology of priority organisms, climate change effects on species and ecological function and multi-scale influences on species distribution. Key work has also included an extensive 10-year programme of assessment of resource quality in Himalayan rivers.

Steve is widely known in research and end-user communities. Current and recent positions include executive editorship of the *Journal of Applied Ecology*, board members of ‘*Freshwater Biology*’ and ‘*Aquatic Conservation*’, member of Council of the Freshwater Biological Association, co-ordinating peer-reviewer of Defra's ‘Biodiversity and Agriculture Research Programme’, numerous advisory panels of the Environment Agency, Irish Environmental Protection Agency and the Institut Français de la Biodiversité. He has been a member of the Countryside Council for Wales, the UK Acid Waters Review Group (DoE), Critical Loads Advisory Group (DETR) and the National Expert Group on Transboundary Air Pollution (DETR).

His lecture will cover the following themes:

Rivers are more than just channels for hydrological discharge, and support organisms from a diverse array of groups in the wetted channel, riparian zone and associated floodplain. Some are of clear economic importance, many are emphasised in conservation legislation, and in total river ecosystems deliver critical goods and services on which people depend throughout the world. At the same time, rivers are at risk from a wide range of pressures that arise at multiple scales. As resources, they are affected by impairments directly to the river channel (e.g. point source pollution, abstraction), by alteration of the riparian zone, and by changes in catchment land use. In this respect, they are among the most sensitive of all ecosystems to human modification, and evidence suggests that extinction rates for river organisms are at least as rapid as those in tropical rainforest.

In this lecture, Steve will offer a range of examples that illustrate the extent of impairment to river ecosystems in tropical and temperate locations, and reveal also the difficulties of restoring rivers once they are impacted: by acidification, climate change, catchment conversion to agriculture, etc. Steve will discuss the opportunities and challenges of positive management which can balance the value of rivers as resources that must inevitably be exploited, and features of major conservation importance.

20 February ‘Water management for nature conservation: conflicts and synergies’

David Gowing is Professor of Botany at the Open University and Director of the Floodplain Meadows Partnership. He studied Botany at Cambridge and started his research career as a plant physiologist in Lancaster, investigating how plants consume water and respond to deficits. He became interested in how species compete for resources and moved to Cranfield University to work with a team of hydrologists and soil physicists to understand how soil water controls vegetation.

He has become involved in the emerging discipline of Ecohydrology and has applied ecological principles to the management of water in soils for nature conservation objectives, advising a range of nature conservation bodies on site management issues. For the past 8 years, he has worked for the Open University, contributing material to their distance-learning modules in Ecology, Environmental Science and Ecosystems. He has built a research group there looking at vegetation ecology in relation to water and nutrient management. His primary research focus for the past 15 years has been the species-rich plant communities of floodplain meadows and their conservation requirements. In 2007, he helped found the Floodplain Meadows Partnership, which is a forum for all agencies involved in their conservation.

His lecture will cover the following themes:

Freshwater conjures up images of lakes, rivers and ponds, but most of our freshwater resource is actually in soils and rocks, where it is stored and through which it flows. The lecture will focus on this unseen body of water and how it interacts with vegetation. The management of soil water is key to many aspects of habitat conservation, especially in floodplains, where all aspects of hydrology are impacted by human regulation of the water cycle. David's talk will address questions around what are the requirements of different species and different habitats in terms of soil water. To what extent can soil water be managed and, when

it is, what conflicts may arise. The focus will be on vegetation response to management, but the implications for other taxa (such as birds and soil invertebrates) will also be discussed.

27 February ‘Getting on with the job: taking practical action for freshwater ecology and conservation’

Paul Raven, FI Biol, is Head of Conservation and Ecology at the Environment Agency, Bristol. Following a Ph.D at University College London on the ecological effects of river engineering, Paul was freshwater specialist at the Department of Environment for Northern Ireland before joining the National Rivers Authority in 1991. He chairs the Water and Wetland Group that supports the England Biodiversity Strategy. Practical experience of river and lake ecology includes the UK and mainland Europe, whilst his main focus of policy work for freshwater is linking ecological objectives and environmental standards under the Habitats Directive and Water Framework Directive.

His lecture will cover the following themes:

Paul’s lecture will cover the critical links between ecological science and practical action. Confidence in understanding environmental pressures and ecological responses is essential in securing practical action both within the Environment Agency and by those with whom it regulates or operates in partnership. The best examples are applying environmental standards to improve water quality, securing habitat gains through flood risk management activities and dealing with invasive non-native species. Assessing the benefits of this work is important for gaining understanding and support for future investment decisions.

6 March ‘Freshwater nature conservation and pollution: how important is it, and what can we do about it?’

Alastair Burn is Principal Specialist, Freshwater and Pollution, at Natural England. He spent 12 years in research in insect ecology and pesticides, before working on pesticide policy for four years with the National Farmers’ Union, finally joining English Nature in 1992. At English Nature he worked initially on pesticides, toxic substances and pollution. He then led English Nature’s freshwater team up to the formation of Natural England, and is now a principal specialist in Natural England’s Evidence Team. He chairs the Wetland Habitats Action Plan Group, and is Natural England’s representative on the Water and Wetland workstream of the England Biodiversity Strategy.

His lecture will cover the following themes:

Freshwater Sites of Special Scientific Interest (SSSIs) are in poorer condition than any other SSSIs. Such protected freshwater sites present a major challenge due to the fact that many pressures arise off-site (i.e. within the wider catchment); the wide range of different human activities which operate in those catchments and which affect freshwater ecosystems; and the complex interactions between such activities. Pollution remains one of these key pressures. Over recent years there has been extensive investment in tackling major point sources of pollution, and country wide initiatives are underway which aim to deal with diffuse pollution and its effects on SSSIs.

But how do we determine our objectives for managing pollution in areas designated for nature conservation? What powers and measures do we have to deal with this problem and how do we determine responsibility for action where there may be multiple causes of a problem? This lecture will examine how Natural England is addressing this issue together with the Environment Agency, and will look at past successes, prospects for future successes and some of the future risks that lie over the horizon.

13 March ‘Does climate change pose a threat to our freshwater ecosystems?’

Rick Battarbee FRS is Emeritus Professor of Environmental Change and former Director of the Environmental Change Research Centre, UCL. He has pioneered the use of diatoms as indicators of aquatic ecosystem change, and together with his research group at UCL, has successfully applied diatom analysis to problems of eutrophication, acidification and salinisation of lakes in the UK and throughout the world. He has advised UK DEFRA on problems of acidification in the UK and has been a prominent member of the International Geosphere-Biosphere Programme on Past Global Environments (PAGES). His group has led a series of EU funded projects on European mountain lakes and it currently coordinates a major FP6 Integrated Project on “Climate change impacts on European freshwater ecosystems (Euro-limpacs)”

His lecture will cover the following themes:

Although General Circulation Models vary in their projection of future climate change, all are in agreement that significant warming will occur within this century, principally as a result of a continued rise in the concentration of greenhouse gases, especially carbon dioxide.

The principal questions for freshwater ecologists are what will or might be the potential effects of future climate change on the structure and functioning of freshwater ecosystems in the future, and to what extent do current policies and practices designed to protect aquatic ecosystems need to be modified to accommodate problems of significant future climate change.

In this lecture Rick will consider these questions with respect mainly to European freshwaters and to the implementation of the EU Water Framework and Habitats Directives.

20 March 'The Future of Freshwaters: lessons from the Merchant of Venice. Have we backed the wrong horses in our conventional approaches to conservation and in the very nature of our society?'

Brian Moss has been Holbrook Gaskell Professor of Botany at the University of Liverpool since 1989 but will be unlikely to be able to identify the pink-flowered tree in your garden because he has been a freshwater ecologist for many years and the botanical connection is with algae and aquatic plants. He has held posts in Malawi, the USA and UK and has taught or carried out research or both on six continents over a period of over forty years. He is an experimentalist whose current research involves eutrophication, lake restoration and climate change and in addition to the conventional long list of papers in learned journals, he has published a well-known text book on the Ecology of Freshwaters, a New Naturalist book on 'The Broads', and a manual for shallow lake restoration.

He is also much concerned with wider global environmental problems and how art and poetry might be used to get over messages about the environment to the wider public. He has been President of the British Phycological Society, Vice-president of the British Ecological Society and recently was elected President of the International Association for Limnology. He was awarded the Association's Naumann-Thienemann Medal in 2007 for his research and leadership in creating new understanding of shallow lake function. Despite all this he would want to be remembered as a non-establishment, liberal and liberated iconoclast.

His lecture will cover the following themes:

Land and water are inseparable, like blood and flesh. But our conventional approach to conservation barely recognizes this and not surprisingly almost every freshwater habitat in the UK is badly damaged and most are still in decline. They are also likely to remain so for although the current EU Water Framework Directive is revolutionary legislation, it is being undermined by conservative, traditional approaches and political considerations. The guts of the solution to our local UK problem lie in solving the current major threats of climate change and ecosystem destruction, which exacerbate the world-wide problems of nutrient and toxic pollution, acidification, drainage, engineering damage, and so many invasive species that the world's lakes, rivers and wetlands are vastly changed from what they were only decades ago, let alone in the pre-industrial period. The approaches of earth system science and replacement of current philosophies of conservation, essentially versions of gardening and zookeeping, in favour of restoration and maintenance of mechanisms that stabilised the state of the biosphere until very recently, are the only solution.

The Ecology and Conservation Studies Society aims to foster interest in conservation based on sound ecological principles by arranging lecture courses, field visits and meetings, and by keeping its members up to date on literature, new concepts, research and practical field studies techniques. Membership is open to all who have relevant experience or interests. Non-members are most welcome at these lectures series.

Web site : <http://www.bbk.ac.uk/ce/environment/ecssociety/>

The Autumn 2009 Free Public Lecture Series will be run in collaboration with **Birkbeck Institute of Environment**. It will be held on six Friday evenings from **16 October to 20 November inclusive**. Watch our website, - details will be posted in late spring.

This lecture series

'What's in a Name? - taxonomy and biodiversity' Saving our Experts from Extinction!

will have its emphasis on the importance of being able to identify the natural world, with examples of the need and uses of giving specimens a name. Lectures are by national experts and enthusiasts.

After an introductory lecture covering developments from Darwin and Linnaeus to modern molecular bar-coding, there will be lectures from fields such as fungi, forensics, invertebrates, finding new food sources and medicines, and control of illegal products through CITES. The concluding session will be a panel review on how the next generation of naturalists is being inspired and how to encourage more to enter the field of taxonomy.