

Editorial

1. A house without foundations. *Martin Spray*

Feature articles

2. Ecology: what next? *Jill Sutcliffe*
14. Plants in peril. *Clare O'Reilly*
22. Critical choices for early ecology education. *Karen Devine*
28. Getting started in conservation – better late than never.
Ruth Boogert
33. Getting started in conservation – climbing the rungs of
the green ladder. *Andrea Gear*
41. Going wild - reconnecting children with the natural world.
Fiona Danks & Jo Schofield
47. Looking ahead in conservation. *Andrew Harby*
56. An all-consuming passion. *James Robertson*
66. Where now 'Hell and High Water'? *Alastair McIntosh*
77. Rewilding the political landscape. *Peter Taylor*

85. Book reviews

- Say Goodbye to the Cuckoo • From Peat Bog to Conifer Forest
- The Carrifran Wildwood Story • The Wind farm Scam
- Managing Scotland's Environment • Where the Wild Things Were
- Conservation Refugees • The Norse Mills of Lewis
- Shetland's Crofting Culture • The Handbook of Sustainable Literacy
- The Dark Mountain Manifesto • Heaven and Earth – Global Warming, the Missing Science
- The Climate Caper • A New Climate for Theology • Down to the Wire: Confronting Climate Collapse
- Sustainable Energy without the Hot Air.



ECOS

A REVIEW OF CONSERVATION



Managing Editor:

Rick Minter

Tel: 01452-739142

e-mail: ecos@easynet.co.uk

Assistant Editor:

Martin Spray

Hillside, Aston Bridge Road, Pludds, Ruardean, Glos. GL17 9TZ

Tel: 01594-861404

Acknowledgements

This issue was edited by Rick Minter and Martin Spray.

Main cover photo by Paul Glendell www.glendell.co.uk

The opinions expressed in ECOS are not necessarily those of BANC Council or of the Editors

ECOS may not be reproduced, transmitted in any form or by any means, in whole or in part, in English or other languages, without the prior written consent of the publisher, BANC.



Vice-Presidents:

Marion Shoard,
John Bowers,
Duncan Poore,
Adrian Phillips

Secretary:

Graeme Duckworth

Treasurer:

Derek Bensley

BANC is a non profit making company limited by guarantee, registered in England No. 2136042. Registered charity No. 327595.

ECOS is printed by Severnprint on Evolution Paper and Board which has a 75% recycled content (and 50% post consumer waste). The electricity used during printing is sourced from Ecotricity which is electricity generated from renewable sources. The magazine is printed under the SylvaPack environmental print route using a waste reducing production system, reusable boxes for delivery and a donation is made to Tree Aid to support tree planting schemes in sub-Saharan Africa.

BACK COPIES OF ECOS

The following back copies are available for purchase. Costs range from £8.30 (inc p&p) for issues from the current and previous year's volume, to £5.30 for older issues.

Up to date prices and order forms for back copies are available at www.banc.org.uk.

- ☐ 30 (2) Nature at our service?
- ☐ 30 (1) 30 years back – and forward
- ☐ 30 (1) 30 years back – and forward
- ☐ 29 (3/4) New nature – old creatures
- ☐ 29 (2) Nature's tonic
- ☐ 29 (1) Walking the talk in conservation
- ☐ 28 (3/4) Climate Change adaptation – helping nature cope
- ☐ 28(2) Nature's Id
- ☐ 28(1) Loving Nature?
- ☐ 27(3/4) Accepting the wild?
- ☐ 27(2) Shores and seas – the push for protection
- ☐ 27(1) Species reintroductions
- ☐ 26(3/4) Aliens in control
- ☐ 26(2) Carbon, conservation and renewables
- ☐ 26(1) The extinction of outdoor experience
- ☐ 25(3/4) Wilder landscapes, wilder lives?
- ☐ 25(2) Superquarry finale & last chance for the countryside
- ☐ 25(1) Wild boar and wild land
- ☐ 24(3/4) Extinction of Experience
- ☐ 24(2) Urban greening
- ☐ 24(1) Nature conservation – Who cares?
- ☐ 23(3/4) Citizen Science
- ☐ 23(2) Reintroductions and aliens
- ☐ 23(1) Land reform
- ☐ 22(3/4) Nature in the neighbourhood

ECOS & BANC - keep in touch on the web

BANC's web site offers a chance to...

- Follow up the debate in ECOS between issues
- Link to current news in conservation as it breaks
- Learn about new initiatives and campaigns

www.banc.org.uk



www.banc.org.uk

**BANC inspires innovation
in conservation.**

Vice-Presidents: **Marion Shoard**

John Bowers

Duncan Poore

Adrian Phillips

Secretary: **Graeme Duckworth**

Treasurer: **Derek Bensley**

Other Members of Council:

Ruth Boogert

Mathew Frith

Rose Goodwin

Adrian Koster

Andrew Harby

Subscriptions/BANC membership

Subscriptions for ECOS are **£25.00** for individuals and **£80** for corporate/institutional rate.

Subscriptions should be sent to:
Hallam Environmental Consultants Ltd
Venture House, 105 Arundel Street
Sheffield, S1 2NT Tel: 0114 272 4227
info@hallamec.plus.com
Subscription form available at
www.banc.org.uk

Subs taken out on or after 1 October remain valid until 31 December in the following year.

A house without foundations

Recent Field Studies Council research suggests that most children leave primary school knowing few of the organisms around them, particularly plants. Later, at A-level, few biology students can name more than three common wild flowers, and a third of their teachers know fewer than four. An ability to name things is of little interest, and is thought unimportant: it's "a job for specialists" according to Anne Bebbington in the *Journal of Biological Education* 39(2) 62-67, 2005.

Unfortunately, such specialists are now in short supply. Identification and taxonomy are both shunned by students, and nearly everybody else. 'Biodiversity' is a favourite word; but how many of us can make a meaningful count of it, except the furred and feathered, the conspicuously floral, some trees, and our handful of butterflies? How about the 5,000 British hymenoptera, or 800 bryophytes? What is true of professionals and academics applies also to amateur naturalists. We should be worried by that.

We should also be worried by this. A scientific understanding is a necessity for conservation in practice. Jill Sutcliffe sketches the history of the relationship with ecology in this issue. You might think studying ecology would be increasingly popular. Far from it: while 'eco-' has been attached to the vocabulary of washing-up and shopping-bags, 'ecology' itself is being put into the store cupboard.

Young children certainly learn the words, but their ecological understanding looks quite inadequate to let them appreciate their impact on their world, let alone help them live lightly in it. At A-level, Karen Devine tells us, biology students find ecology the *least important* topic. In the universities, ecology is often a shadow – definitely not the 'must take' subject many greens used to predict.

Taxonomy; ecology: anything else?... You might expect a queue of botanists for careers in conservation, protection and restoration work, *and* in such things as biofuel research and the doubling of world food-production, but numbers have crashed. Only two UK university plant science departments survive. Though many places offer plant science degrees, courses, or modules, plants are neither cuddly nor sexy enough (or botany not lucrative enough?) to attract more than a dribble of students. This is Clare O'Reilly's sorry news.

The story repeats for entomology, mycology, and doubtless other ologies. But take heart: people still find their way into the real world of nature conservation. Two describe their travels in this issue. Andrea Gear enthuses about her route to the Mauritius kestrel, and Ruth Boogert shows it's possible to break out of a 'normal' life, and take a career change into conservation, while making a short sacrifice when retraining. Both exemplify the fundamental importance of mixing skill and expertise with energy and a belief in what they are doing.

Ecology: what next?

2010 has been declared the United Nations International year of Biodiversity so now is an appropriate time to take stock of the subject of ecology, its progress and its vital importance in understanding the way the planet works.

JILL SUTCLIFFE

The 'paradigm shift' concept was developed by Thomas Kuhn in 1962¹ with reference to scientific understanding. He outlined a process in which the seeds of the next paradigm exist within the present one but that any changes which occur are being driven by key factors. Thomas McKeown², suggested that policy implementation followed a cycle. He argued that any new threat would take some 20 years to be identified, a further 10 years for an effective policy to be put in place and another 10 years for professionals to act on it.

Adopting this approach and starting when the word ecology was coined in 1869 leads to the following structure below, which this article follows. The distinction between this and natural history which had been pursued since Greek times was the emphasis on a more rigorous approach to experimentation rather than direct experience.

1869–1908:	Pioneer phase
1909–1948:	Successional phase
1949–1988:	Establishment phase
1989–2008:	Mature phase
2009 on	The Future and some recommendations

1869–1908: Pioneer phase

Although there was what we could now call 'ecological thinking' before Ernst Haeckel first used and defined the term ecology - from the Greek for 'household' and logos, 'study of' - in 1869³ it was the definition which helped to anchor the subject. He interpreted the notion of a household as a place where numerous organisms live and interact.

Context

The study of ecology evolved alongside the emergence of some of the specialist scientific societies which were largely set up by amateur natural historians. This early phase overlapped with what we generally think of as "natural history". Just 10 years earlier *The Origin of Species* by Charles Darwin had been published which emphasised the ecological inter-relatedness of life on earth and the physical world, climate, plants and animals including humans.

Mechanisms and tools

Ecology as a scientific subject emerged only slowly. What did become clear was the impact that some human activities such as enclosure and drainage were having. The glimmerings of modern conservation began when people started lamenting that they couldn't find large copper butterflies at Whittlesea Mere; and books such as those by George Manville Fenn in the 1880s demonstrated the conflicts between the natural history interest of the fens and the desire to drain them. Gosforth farmers protected their vegetables on the way to the market at Whitehaven by packing them into their carts in the haulms of Royal Fern *Osmunda regalis* but this fern was gradually being exterminated by collectors servicing the fern craze.⁴

Institutional infrastructure

Some parts of the institutional infrastructure including the Royal Society and the Linnaean Society of London - the world's oldest active biological society founded in 1788 - pre-dated the definition of Ecology. The Linnaean Society recognises the importance of documenting the world's plants and animals to inform conservation.⁵ The Botanical Society of the British Isles (BSBI) also pre-dates the emergence of ecology having started in 1836 and the Royal Society for the Protection of Birds (RSPB), was set up in 1889 when three women joined together to object to the use of feathers in fashion. These organisations focused exclusively on plants and birds without reference to the wider ecology.

New development

In 1885, the *Gentleman's Magazine* urged that a society be formed for the protection of wild flowers and other life forms.⁶ The British Society began to take up the issue from 1887. Three years later Druce made an attempt to interest natural history societies in a bill to protect wild flowers but nothing happened. The National Trust was established in 1895, founded by three Victorian philanthropists - Miss Octavia Hill, Sir Robert Hunter and Canon Hardwicke Rawnsley. Concerned about the impact of uncontrolled development and industrialisation, they campaigned for the availability of open spaces for poor people and set up the Trust to act as a guardian for the nation in the acquisition and protection of threatened coastline, countryside and buildings.

1909–1948: Successional phase

Natural history began to evolve in its complexity and, by 1910, nature study was being widely taught in schools. The subject became so popular that some plants began to be threatened by collection.

Context

At the turn of the twentieth century radioactivity was discovered and named which led to the study of the transfer of radionuclides through the environment and their uptake into a range of species. This branch of ecology studies the environmental impact of radioactive substances and has provided a tool which enables food chains to be traced and identified.

Mechanisms and tools

In 1911, A G Tansley wrote *Types of British Vegetation*⁷ as a guide for the International Phytogeographical Excursion, a pioneering study in the emerging science of ecology. This occurred at the critical period during which botanists were beginning to study plants as elements in a community, habitat or landscape. The great Excursion did its last fieldwork in Cornwall where a special train was laid on, to stop in the countryside near Cryon Downs. The botanists asserted that the heath was so important that it should be preserved in perpetuity. Carrine Common, as it is now known, has survived and is, in part, a Site of Special Scientific Interest.

Institutional infrastructure

In 1904, G. Smith and others founded the Ecological Society when they met at his house in Leeds and this initiative evolved into the British Ecological Society in 1913 publishing its own journal and bringing research into the picture.

A variety of groups focusing on nature followed. In 1924, the British Correlating Committee for the Protection of Nature was formed. In 1927, E J Salisbury gave an address concerning the waning flora of England. He was a friend of Charles Darwin's grand-daughter, Nora Barlow who was a keen conservationist long before conservation became a fashionable word. In 1930, the Society for the Protection of Wild Flowers and Plants was formed and a Wild Plant Conservation Board was established. This was responsible for drafting a private bill to protect plants but it never got support.

A Conference on Post-War Reconstruction included sessions on national parks and the enjoyment of nature by the general public. One idea was to create reserves as sanctuaries for rare species, where access would be controlled. In 1942, the Scott Report on Land Utilisation in Rural Areas proposed a national system of planning and the protection of agricultural land, while in 1945 the Wild Life Conservation Committee of England and Wales was set up under the chairmanship of the eminent biologist Julian Huxley.⁸ The Huxley Report, published in 1947, contained a list of proposed nature reserves where wildlife would be effectively studied and protected. The Committee also recommended the setting up of an official biological service to establish and maintain the reserves, carry out the necessary research and advise on nature conservation generally. The Government accepted the recommendations and in 1948 set up the Nature Conservancy, which gained its powers from the National Parks and Access to the Countryside Act 1949.

New developments

Sir Julian Huxley went on to set up a new international environmental institution in his role as the first Director General of UNESCO from 1946-48. It sponsored a congress at which the International Union for the Protection of Nature (now IUCN) was established in 1948.

"Protected areas and threatened species could most effectively be safeguarded if local people considered it in their own interest to do so. Working with rather than against local people became a major working principle for IUCN." P 61⁹

1949–1988: Establishment phase

During the late 1940s, Aldo Leopold emphasized the integrity and stability of ecosystems. As he put it in *A Sand Country Almanac* 1949¹⁰: *"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."* Thus Leopold combined ecological statements with an ethical approach.

Odum broadened out the original definition of ecology to include the study of the structure and function of nature. Later, after a contested period, the term conservation became more widely used, a term which Carl F. Jordan defined as: *"biological conservation ... being a philosophy of managing the environment in a manner that does not despoil, exhaust or extinguish"*.¹¹

Context

In the UK, legislation was passed to establish a statutory nature conservation body to advise government – then known as the Nature Conservancy (NC)¹² - and the start of the Protected Areas network. The first National Nature Reserve was established in 1952 at Kingley Vale, Sussex, where there is the largest yew wood in Europe and the identification of Sites of Special Scientific Interest (SSSIs) began of which there are now in excess of 4,000 in England alone.

Mechanisms and tools

An unintended consequence of the atomic bomb tests held in the 1950s was the transfer of the radionuclides produced via the atmosphere to areas far from the test centres. One impact was their uptake by lichens which were then eaten by reindeer in the Arctic Circle. In 1956, the science of radioecology was named at the same time by Odum in the US and Kuzin in Russia.¹³ Suddenly the need to understand such cycles and the impacts on species became global in scale. An activity in one part of the world could have impacts far away. Or, as Rachel Carson¹⁴ discovered, the take up of DDT by a small part of the food chain could travel up the chain and biomagnify, thus having a larger impact the further up the chain the pesticide travelled, hence the impact at the top of the food chain and the loss of peregrines, otters, pelicans and other species. This disaster was addressed by establishing the scientific evidence and then by the insecticide being banned in the west although it is still widely used elsewhere in the world. In this case, the pollutant had serious effects on the system which was brought to people's attention by the impacts on wildlife.

"Carson was attacked by the chemical industry and some in government as an alarmist, but courageously spoke out to remind us that we are a vulnerable part of the natural world subject to the same damage as the rest of the ecosystem. Testifying before Congress in 1963, Carson called for new policies to protect human health and the environment" Linda Lear, author of *Rachel Carson, Witness for Nature* (1997).

The effects she had identified came to light only 14 years after the first applications of DDT.

The botanists compiled the first atlas of the British flora in 1962¹⁵ and issued the first Red Data Book 1977.¹⁶ Other taxa followed. A key publication was the *Nature Conservation Review* by Derek Ratcliffe, in 1977¹⁷, and, coincidentally the research scientist who unravelled the impact of DDT on peregrines discovering that it had made their egg shells too thin to support the adults, the most widely cited scientific research paper. Then in 1987 following the production of the World Conservation Strategy in 1980¹⁸, Gro Brundtland, published *Our Common Future*¹⁹ - outlining the need for sustainable development which incorporated Economic, Environmental and Social factors being considered together.

Institutional infrastructure

In 1972, the first international UN Conference on the Human Environment was held in Sweden. Hardly any governments attending had environment departments at the time. The famous picture of the Earth was taken by The Apollo 17 mission in December which, it is said, stimulated an enormous realisation about the extent of the planet, its limits and its vulnerability. Increasingly the European Union took an interest in environmental affairs setting up its Environmental and Consumer Protection Directorate in 1973 and drawing up its first Environmental Action Programme.

In the UK, large numbers of people were unemployed, a factor which led to the government setting up the Manpower Services Commission whereby groups could apply for funding to help train people. Many NGOs - including the Wildlife Trusts - benefited from these funds over 10 years. It led to a rapid professionalisation of those involved in wildlife conservation and land management and a trained workforce made sure that landscape and species issues got taken into account.

New developments

The then Nature Conservancy embarked on discussions with academia as it became aware of the need to have staff adequately trained in the skills it needed as an organisation. In 1960, the first postgraduate course in conservation was set up at University College, London. Ecologists need a mixture of skills and training in order to become professionals. They need the theoretical underpinning, an understanding of conservation issues together with practical skills regarding site management as well as generic skills. These can be obtained via a range of different routes but many undertake specialist courses and keep up to date via Continued Professional Development.

1989–2008: Mature phase

The first global agreement on wildlife was adopted in 1992²⁰ The Convention on Biological Diversity defines bio - diversity (short for biological diversity) as:

"The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems".²¹

This included genetic issues and also put the emphasis via its Agenda 21 on local implementation. This gave rise to a web of institutions, organisations and

volunteers playing a role in translating the hopes and intentions into relevant actions via Biodiversity Action Plans, Habitat Actions Plans and fitting these into international, national, regional and local frameworks.

Context

In July 1989 a Little Egret, small white heron, arrived at Pagham Harbour Local Nature Reserve. It was the 16th such visit since records began. What people didn't realise was that it heralded an influx, such that it now breeds here. Many saw it as a sign of climate change – why else could it retain a place in the nation's fauna? The EU introduced legislation including the Species and Habitats Directive²² in 1992 – and committed to Halting the Loss of Biodiversity by 2010 following a conference held in Malahide, Ireland in 2004 where it was recognised that biodiversity loss was continuing at an alarming rate with serious potential consequences for sustainable economic growth and livelihoods.

Mechanisms and tools

The issues of wildlife conservation had been overlooked by the planning system, that was, until the introduction of Environmental Impact Assessment (1985). Then, developments (in many built sectors) proposal over a certain size were required to have an impact assessment carried out to include noise, dust, flora and fauna. This has expanded to be applied to policies plans and programmes via Strategic Environmental Assessment.²³ However, it can seem as though wildlife and biodiversity issues are considered impediments rather than an important aspect to take into account.

The research and development associated with the Human Genome project led in turn to the development and use of speedier tools for use in genetic work on threatened species. The associated investment in molecular analysis has resulted in increasing numbers of people knowing a plant's genetic code rather than being able to recognise it in the field.

Institutional infrastructure

At the international level, and after extensive consultation, the International Mechanism Of Scientific Expertise on Biodiversity (IMOSEB) has been established to provide a route for the best evidence to feed into policy.

Many more governments developed environment departments and in the UK there was a second wave of NGO development eg Plantlife, Buglife, Bat Conservation Trust and Mammals Trust (see Pioneer phase when BEBI, NT, RSPB et al were set up). Devolution in the UK had its impact on the statutory nature conservation bodies as one UK advisor morphed into five to advise the separate devolved administrations. In order to safeguard standards, a professional body for ecologists and environmental managers, the Institute of Ecology and Environmental Management (IEEM), was established in 1991.

New developments

The Millennium Ecosystem Assessment²⁴ reported in 2005 and this spurred similar national exercises including in the UK. The EU has appointed the economist Pavan

Sukhdev to examine the issues arising from 'valuing' on an economic basis, services such as clean air, water, food and shelter - all the basics of life needed by earth's population. This is known as 'The Economics of Ecosystems and Biodiversity' (TEEB report) and a valuation toolkit is being prepared. As the editorial in ECOS 30(2) pointed to this is not universally welcomed. Should not the economists be taking on board the importance of environmental limits?

In the UK John Rodwell and others led the development of the National Vegetation Classification²⁵ which enabled the country to be mapped to a baseline standard. In 2003 Andrew Pullin established the Centre for Evidence-Based Conservation²⁶ with the aim of supporting decision making in conservation and environmental management by assessing the available evidence. Strange then that Natural England – an organisation dedicated to the use of evidence – is putting its library in its Peterborough office into store. The setting up of the National Biodiversity Network and the drive to improve data coverage by establishing Biodiversity Records Centres across the country has raised the importance of data for conservation. The Learning Outside the Classroom Manifesto was issued in 2006 and this has been supported by the creation of an associated Commission.

It was recognised that much conservation work and action had concentrated on terrestrial issues and that the Marine environment had been neglected. This led to a flurry of legislation and a concomitant drive to employ staff to map the marine resource, to identify key important sites and to provide insights into the needs of the marine biodiversity. However, the new Marine legislation has overlooked the need to employ specialists.

2009–2028: The future and some recommendations

There have been three reports on Systematics and Taxonomy following inquiries by the House of Lords Science and Technology Committee over the last 17 years.²⁷ The House has been concerned that, without adequate recognition by government and the wider scientific community of the need for improving taxonomy, the national ability to deliver commitments to conserve biodiversity will be seriously hampered. Their most recent report recommended developing a web-based taxonomy, funding from the National Environment Research Council and nominated DIUS to be the lead department for systematic biology.

A number of projects are examining the issue of Ecological Skills Gaps in the UK. The Environmental Research Funders' Forum (ERFF) run by NERC is examining the output of Postgraduate students, environmental skills and the predicted need for environmental scientists over the next 25 years. The Committee Heads of Environmental Sciences (CHES) has been examining the same issue at the Undergraduate level whereas the British Ecological Society (BES) has been using its project, *Starting from Scratch* to look at Education 0-19 years. Natur, the Welsh Institute of Countryside and Conservation Management, has just appointed an officer to carry out a survey of present and future skills gaps in Wales and LANTRA, the Skills Council for the Environment sector, has been carrying out a

skills needs assessment exercise for the UK. The Department of Children, Schools and Families (DCSF) is funding a green space skills survey questionnaire to be administered by the Commission on Architecture and the Built Environment. It is a telephone survey which aims to establish the size and scope of green space sector which includes open areas, local parks, gardens, botanic gardens etc but only a small interface with ecology.

As a young profession, ecology and wildlife conservation have been poorly reflected in employment categories. This is being addressed in an exercise to review the Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC) categories but, while the concepts of conservation and Environmental Scientist are now going to be introduced the plan is to subsume them into agriculture.^{28, 29} It is difficult to obtain the right kinds of statistics about ecology in Higher Education as the subject lies within Biology. The Sustainable Development Commission is working to embed sustainability within government departments.

Following a series of workshops held jointly by the British Ecological Society and IEEM in 2003, 2004 and 2007, IEEM is carrying out a three year research project into the Ecology Skills Gap. Tasks include a review of what was known and identification of other projects examining the issue. We are now entering the phase of gaining current evidence via a mixture of questionnaires, workshops and case studies illustrating key themes. The IEEM conference in March 2011 will focus on the findings.

Recommendations

"Conservation is more than biology. It requires determination, political clout and an understanding of people and economies".²⁸

Lawrence B. Slobodkin²⁹ has argued that the *"unsolved problems of chess, astronomy, or mathematics will not change if we ignore them"* whereas whether or not we act does affect ecology. It affects both ecology [science] and ecology's subject matter..

Understanding the complexity of the natural world is not easy and communicating that presents a large challenge. The use of the term "biodiversity" is not widely understood. There is a strong need for joined up thinking particularly between high level political rhetoric and implementation on the ground. Environmental governance appears to be *"weak, fragmented and generally ineffective"*.³⁰ which undermines progress. There are problems of duplication and there has been a lack of coordination.

Context

Ecology is a relatively young subject and its fundamental principles are still to be fully appreciated and, importantly, acted on more widely. There needs to be an overhaul of statistics so that educational establishments and economic employment analyses can readily obtain the necessary data which is currently *not* available. In addition, ecologists need to comprehend that their way of seeing the world needs to be communicated better to others. Returning to Kuhn (1970)¹

"To understand [scientific knowledge] we...need to understand the special characteristics of the groups that create and use it" (p 210) and additionally, "...what the participants in a communication breakdown can do is recognise each other as members of different language communities and then become translators" (p.202).

Only recently, following a presentation by Georgina Mace to the NERC Board, did some members grasp the importance of ecology.³² Concerns are raised by the increasing lack of specialists (see article by Clare O'Reilly in this issue). More could be made of the analogy between the health of people and the needs of training for medical practitioners and that of the health of the planet and the requisite needs for ecologists. These links are clearly articulated in the book *Sustaining Life*.³³

Mechanisms and tools

The concept of an SSSI will need to become more flexible than fixed in response to climate change but the evolving system must include a rigorous analysis to ensure that the subtle needs of species and habitats are fully captured. The progress originally made in education has faltered - see article by Karen Devine of the BES. In the US³⁴ Richard Louv has compiled a treatise imploring the need to connect people to nature particularly with regards to a generation which has lost touch with wildlife and the outdoors. He has started a movement Children & Nature Network which can be reached at www.cnaturenet.org. There will not be an educated citizenry if there is no education available via both formal and informal channels. All government departments now have a Science advisor or Ecological advisor except the Treasury.

Institutional infrastructure

There needs to be a one stop portal linking up all aspects of ecology. The environmental and ecological institutional infrastructure is very disparate and can perhaps be characterised at best as resembling an amoeba lacking the focus to follow through on ideas and policy change. More importantly, whenever ecology has assumed a central role in policy making it has been systematically dismantled and set back. As a Sussex Wildlife Trust report³⁵ concludes:

"Despite the need for and support of the concept of sustainable development bringing together Economics, Environment/Ecology and Social concerns, biodiversity and the environment are still often seen as obstacles. While there has been a reasonable amount of mainstreaming of these issues and their principles have been incorporated into legislation so that the ideas appear in policy, grant schemes or development plans etc, there is a real concern that nature conservation remains marginal with any changes gained comprising only short term, limited or even negative ones."

Funding is erratic when it needs to be long term and monitoring programmes have absorbed staff with detailed specialist knowledge. Natural history is often thought of as an outdated concept by scientists, but it has long pre-dated the much vaunted interdisciplinary approach and much knowledge resides in this sector courtesy of many volunteers. Currently, ecological research is often published as



part of a sub-discipline, such as botany, invertebrate ecology or ornithology and it is often not drawn together.

The issue of climate change is tending to push everything else to the margin. It is very important that the fundamental nature of wildlife and its conservation resumes its central role in future debates. Non-ecologists take it for granted and some do not even see or understand the issue while ecologists are very busy understanding the needs of species and habitats. However, rather than letting a thousand flowers bloom accompanied by a thousand voices the sector needs to speak up with a strong articulate voice...and quickly.

References and notes

1. Kuhn, Thomas S (1962; 1970). *The Structure of Scientific Revolutions*, University of Chicago Press; and International Encyclopaedia of unified science, 2, enl edition. Chicago; London, University of Chicago Press.
2. McKeown, T (1976). *The Role of Medicine – Dream, Mirage or Nemesis*. London, Nuffield Provincial Hospital.
3. Collins, P H (2004) *Dictionary of Environment & Ecology*, 5th edition, Bloomsbury. linnean.org accessed August 5th, 2009.
4. Spurgin, K S. Unpublished overview of conservation following review of *BSBI News* D E Allen has summarised the history well in The early history of plant conservation in Britain, *Trans. Leicester Lit. & Phil. Soc.* 72: 35-50, 1980 and detailed part of it in *The Victorian Fern Craze*, Hutchinson (1969).

5. <http://linnean.org>
6. Spurgin op cit.
7. Tansley, A G (1911), *Types of British Vegetation*. CUP.
8. Spurgin op cit.
9. Christoffersen, Leif E (1994) IUCN: A Bridge-BUILDER for Nature Conservation, Green Globe Year Book, Accessed Sept 14, 2009.
10. Leopold, Aldo (1949) *A Sand Country Almanac*, OUP.
11. Jordan, Carl (1995) *Replacing Quantity With Quality As a Goal for Global Management*, Wiley.
12. The Nature Conservancy morphed into the Nature Conservancy Council in 1973 and then into English Nature in 1990 under the aegis of the Environmental Protection Act 1990 which established a split into country based advisors before EN was merged with Rural Development Service of Defra and the Landscape arm of the former Countryside Commission to form Natural England in 2006 following the Haskins report.
13. Van der Stricht, Etienne and Kirchmann, Rene eds: *Radioecology, radioactivity & ecosystems*, IUR Project (2001).
14. A research biologist working at the FAO and author of the *Sea*, and *Silent Spring* (1962).
15. *Atlas of the British Flora* (Perring & Walters, 1962).
16. *Red Data book for vascular plants in Great Britain* (Perring & Farrell, 1977).
17. Ratcliffe D (1977) *Nature Conservation Review* two volumes. CUP.
18. *World Conservation Strategy* (1980), commissioned by the United Nations, Living Resources Conservation for Sustainable Development. Stressed the maintenance of essential ecological processes and life support systems; preservation of genetic diversity; sustainable utilisations of species and ecosystems.
19. Brundtland, Gro Harlem (1987) *Our Common Future*, World Commission on Environment and Development (WCED). Oxford Paperbacks.
21. CBD www.cbd.int/convention/convention.shtml
22. Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild fauna and flora
23. SEA Protocol, Kiev 2003
24. www.millenniumassessment.org
25. Rodwell, J published between 1991 and 2000: *Woodlands and scrub; Mires and heath; Grassland and montane communities; Aquatic communities, swamps and tall-herb fens; Maritime communities and vegetation of open habitats*.
26. CEBC.222.cebc.bangor.ac.uk
27. House of Lords Taxonomy inquiries, 1992; 2001-02; and 2008. *5th report of session 2007-08, Systematics and Taxonomy: follow-up report with evidence* (HMSO, published 13/8/08).

28. Pers comm.: Margaret Birch, University of Warwick.
29. Slobodkin, Lawrence B. (2003) *A Citizen's guide to Ecology*. OUP.
30. Chapman J L and Reiss M J (2003), *Ecology, Principles and Applications*, 2nd Edition. CUP.
31. Conca, Ken and Dabelko, Geoffrey D. (2004), *Green Planet Blues, Environmental Politics from Stockholm to Johannesburg*. Westview Press.
32. BES Conference, talk by Ken Norris, NERC Biodiversity Theme Leader, September 2009.
33. Eric Chivian and Aaron Bernstein eds (2008), *Sustaining Life, How human health depends on biodiversity*. OUP.
34. Louv, Richard (2008) *Last Child in the Woods, Saving our Children from Nature-Deficit Disorder*, Algonquin Books of Chapel Hill
35. *Sussex Wildlife Today* (2007) A report on how wildlife in Sussex has fared (sic) since the publication of *Vision for Wildlife of Sussex* (1996).

Jill Sutcliffe is the Ecological Skills Gap Project Officer based at IEEM having worked for almost 40 years on ecological issues – encouraging student environmental action groups, the establishment of courses, setting up wildlife clubs for young people and as lead specialist at Natural England on plants and fungi. In her voluntary capacity she is Vice Chair of the Manhood Wildlife and Heritage Group. jillsutcliffe@ieem.net

Ecologists research the spread of Caledonian Pine forest on Mar Lodge Estate in Scotland.

Photo: www.glendell.co.uk



Plants in peril

As plant science degrees disappear, should the ecology and conservation sector respond?

CLARE O'REILLY

Plant science encompasses diverse areas relevant to conservation and ecology, ranging from physiology and reproductive biology to population genetics. Ecology and conservation sector employers have identified a botanical identification skills gap among recent graduates which reflects a wider lack of interest in plants in biology education. Plant science is struggling. Conservationists should be concerned.

The tyranny of numbers

University applicants have increased 30% in the last six years with over 615,000 people seeking degree course places this year.¹ By contrast, UK applicants (there are also foreign applicants) for plant science single honours degrees average just 104 annually.² Although the figures are a proxy for actual participation - as students change courses - the available quantitative evidence suggests that numbers are unsustainably low.

Compared to other science subjects undergoing well-publicised declines such as physics and chemistry³, plant science is doing spectacularly badly. Single honours courses have steadily shut down, leaving only 9 universities offering BSc plant science degrees for 2009-10.⁴ By contrast, there were 44 institutions offering physics single honours degrees for 2007-08.⁵

The weak position of plant science is masked by the relative popularity of biology, and contrasts with that of zoology. Six universities offering plant science degrees all report an intake of usually only two or three students per year, whereas degrees in zoology continue to recruit sufficient numbers to make them viable as a separate degree programme.⁶ 535 UK students were studying under- or postgraduate plant science in 2006-07, compared with 3705 on zoology programmes and 12,680 studying physics.⁷

Has plant science always been a minority interest?

Recent research on plant science in higher education by Warwick University² found that home student applications and acceptances stayed more or less level over the last 10 years. Locating pre-1999 data on student numbers is difficult, even from individual universities. Long-standing members of staff can provide some historical context. Stephen Jury, principal research fellow at the University of Reading, recalls that since 1970, its BSc botany degree has had roughly 10-12 undergraduates a year, until it ended this summer. He explained that the closure was due to economies of scale: a university typically gets over 60% of its revenue from student fees, and the

Government's University Funding Formula is per head not per course. So courses attracting low numbers are not viable even where the demand is steady.

Vanishing act

While student numbers may have not dropped dramatically, there has been a decline in how 'visible' plant science is as a subject over the last 20 years. Botany disappeared as an O- and A-level subject in the mid 1980s and plants have formed less and less of the curriculum in Biology GCSE, particularly after the shift by many state schools to General Science GCSE.⁸ With regard to University level, there are only two Plant Science Departments left (Oxford and Cambridge). Universities point out that students are still studying plant science modules, as part of biology degrees, and that the strategic integration of plant science in bioscience departments is beneficial.⁹ This is certainly true internally from a financial point of view, enabling modules to run, but arguably not for the status of the subject when viewed externally.

Lack of visibility as an academic subject is compounded by a blurred public image. The study of plants has often been part of a different subject: it originated as part of medicine, then progressed as part of the rise of ecology from 1900 to the 1920s with Tansley's and Turesson's studies¹⁰, after which it became very much an applied subject as part of agriculture and forestry in the 1930s to 1950s. It became a 'lab science' only with university expansion in the 1960s; indeed, a professor of botany writing in the 1970s felt he had to justify calling his subject a science.¹¹ By the mid 1990s, molecular biology had become dominant and today there is a trend to include plant modules within biomedical science.¹² As a result of this history, plant science lacks a coherent social identity. In addition, plants tend to be equated by the public either with gardening or natural history, rather than science.

Why is lack of visibility so significant?

Several lecturers consulted during research for this article commented that a Department of Plant Sciences was important to give the subject prestige or kudos. This is highly significant because any loss of prestige may affect student demand for a subject.

In modern societies, prestige is determined by an individual's position in hierarchies of attainment, often judged as a combination of financial, academic, political and psychological success. It exists as a function of social inequality, which has intensified in recent decades: from 1979 to 1999 there was a general increase in inequality in industrialised nations, reversing previous trends since the 1940s.¹³ Social organisations such as universities reflect the power and prestige pyramid of wider society.¹⁴ Social stratification is further reflected in the fact that which university you attend directly affects your post-graduate earnings.¹⁵

The economist and historian Max Weber theorised that social stratification is a result of the interaction of wealth, prestige and power.¹⁶ Therefore it would not be

surprising for degree subjects, as well as institutions, to become stratified into winners and losers, driven by access to funding¹⁷, and the relative political power of individuals and collectives within institutions. If degree subject prestige exists, it relies on ongoing recognition. If a subject lacks visibility its prestige declines.

Educational psychologists, notably Gottfredson's theory of vocational choice (1981)¹⁸, predict that three key variables influence career choice at different ages: gender stereotypes, prestige, and personal interest. This theory emphasises that gender-types are most enduring, and that prestige overrides interest during late adolescence, just at the time young people are selecting A-level and degree subjects. This theory has been shown empirically to be an over-simplification, but its testing has generated useful data on the relative influence of prestige.¹⁹ Separate studies of both university students and 16 year olds have found that their interests only took precedence where the career on offer was already acceptably high in prestige.²⁰

If a subject lacks visibility, it lacks prestige. Students prefer prestige. So reduced subject visibility results in reduced student demand.

A future for plants in general biology?

A relatively large number of institutions (around 48²¹) offer plant science as a specialism for those initially enrolled on bioscience degrees. It is unknown how many students actually take this route, although some do, as otherwise the existing single honours plant science degree courses would not run at all.²² However, it would be unwise to rely on this recruitment route, without understanding student demand for plant science modules and whether this realistically can increase.

Plant biology, like ecology, is extremely unpopular in A-level Biology, compared to human biology and biomedical topics.²³ The drivers behind this rejection have been attributed to preference for cuddly mammals²⁴ and to the GM crop controversy putting budding biologists off 'evil' plant science.²⁵ While undoubtedly strong influences, this focus on consumer fashion denies young people a level of sophistication and rationality in their decision-making.

Rather than looking to identify a myriad of reasons suggesting unpopularity on a subject by subject basis, rejection of subjects like plant science and ecology may be accounted for more persuasively with one unifying explanation – as the Occam's razor principle recommends that we include no more in an explanation than is strictly needed.²⁶ This explanation may be the culture of generalisation in education.

Young people know that "the rewards education brings are as much to do with being labelled a 'top' or a 'near-the-top' person as they are to do with the subject you studied".²⁷ Over half of graduate job adverts do not specify a subject.²⁸ Anything that looks like a specialism faces scrutiny as it is thought to unduly narrow career choices (a recurrent student concern at Gatsby Plants Summer Schools²⁹). Plant science, irrespective of its image (whether dull or interesting), looks high risk compared to biology. Young people are acutely aware that their status as



Field botanising in Scotland.

Photo: Clare O'Reilly

undergraduates has been hard won in a climate of increasing competition. In politics, status is often more about a fear of losing what you have, than any desire to gain.³⁰ So it is safer and rational to stick with general (preferably human) biology.

Specialism is also apparently rejected by some high profile biology graduate employers: *"Specialism is not very current in government conservation agencies. There are only 1.5 botanist posts in Natural England, just 10% of a post for lichenology, and an unwillingness to expand on that limited capacity"* (Nicola Hutchinson, Plantlife International).

Some plant science academics also seem resigned to generalism, and their views will influence and reinforce student perceptions:

"I don't really see why we have to teach plant biology as a separate discipline. There is no reason why it cannot be integrated into other life science units. I think that that is the way we might have to do it.... We could be being our own worst enemy in wanting to maintain plant biology as a separate discipline" (Senior lecturer, 1960s university)

Increasingly, and perhaps most potently, students may see the government target of 50% of people possessing a degree, coupled with the short fall of places this year, and then focus on the need to have a degree – any degree.

This culture of generalism in higher education is powerful but students may make independent choices if they can identify with a clear career goal. Several sources, representing lecturers, students and employers, all stress that lack of careers advice is a key issue in inhibiting specialism in plant science.³¹ *"We seem to be quite good at addressing the schools level; but there is much less attention given to the post-compulsory stage and careers advice"* (Nicola Hutchinson, Plantlife International).

The first two Gatsby summer schools resulted in 22 undergraduate biologists choosing plant science PhDs, with 70% of them citing the summer school as influencing their choice. However, overall, students do not regard plant science as an area rich in career opportunities outside of academia.³² Clearly, careers advice is crucial: *"Where there is no vision, the people perish."* Proverbs 29:18.

Does it matter?

One interpretation is that there is not any significant decline in plant science, just a shift in locus of provision, and that the disappearance of single honours degrees is acceptable. There are ethical, political and economic challenges to this view. One ethical view, that students should have the opportunity to study the full range of plant science topics on a 'pure' single honours degree course, is important:

"We think that for the very small number of students who really want to be called botanists, we should preserve it [the botany BSc degree]." (Russell Group University lecturer⁴).

Everyone should have the opportunity to study a full, coherent range of plant science subjects, which is only possible on a dedicated degree programme. Students progressing to plant science PhDs would benefit from the breadth and depth of grounding from a plant science first degree. Masters degrees may be an area for future development, but these need employer support, and more flexible delivery options, such as distance learning, to overcome funding issues.³³

There is also political pressure to address the current position of plant science, as the Government has an obligation to deliver target 15 of *Plant Diversity Challenge*³⁴ to promote training in whole plant biology.

However, the most persuasive arguments available to influence policy makers are invariably economic.

Employer skills needs are currently top of the agenda in education policy. The ecology sector needs specialists with knowledge of a range of plant science topics, not just taxonomy. Vegetation assessment, mitigation, restoration, creation and monitoring all require a suite of skills, beyond plant identification and surveying, encompassing, for example, plant physiology, reproductive biology and autecology. Ecologists devising habitat restoration schemes need to understand how these factors interact.

"I did a BSc in ecology but then a plant physiology PhD as you need the plant physiology to understand the ecology. You need quite a bit of plant ecology, reproductive

biology and physiology to be able to work on vegetation restoration or rare plant conservation studies. The best way to get this range of understanding is from a botany degree." (Tim Rich, Head of Vascular Plants, National Museum of Wales).

Human and most animal life depends on plants so plant science should hold a remarkably strong position in economic debates. Plants are a vast and central part of ecosystem services. The world's population will need 70% more food by 2050, largely due to increases in wealth, not population numbers.³⁵ Demand for plant scientists is likely to increase:

*"A number of respondents believe that there could be a significant increase in labour market demand for plant scientists in the next decade, based on the vital role of plants in relation to key global issues such as climate change and food production."*³⁶

Some developments in this direction are already occurring, for example, there will be opportunities for 120 plant science researchers at the new Sainsbury Laboratory in Cambridge.

Should plant science really be relegated to a fragmented specialism, when it is so central to our own survival and that of the many animals we aim to protect as conservationists? A number of initiatives are underway, and careers advice must be a priority, but the case for plant science also needs maintaining at a policy level. The ecology and conservation sector needs to support plant science as a distinct subject. Above all, a wide and vigorous debate on the place of plant science in society is long overdue.

References

1. The *Sunday Times University Guide* 13.09.09.
2. Annual mean of botany home applicants for 2002-08, for JACS code C200 which includes plant science, plant biology, and related degrees. From P. Stagg M. Wahlberg A. Laczik & P. Huddleston (2009) *The Uptake of Plant Sciences in the UK. A Research Project For the Gatsby Charitable Foundation*. The Centre for Education and Industry, University of Warwick.
3. The demise of physics has received repeated national press coverage over several years e.g. 'Physics degree courses axed as demand slumps' *The Independent* 23.1.97; 'Concern over decline in physics' *The Times* 21.11.06
4. Stagg et al. (2009) op. cit.
5. University College Union. 2007. *Degrees of Decline? Core Science and mathematics degree courses in the UK 1998-2007*.
6. Stagg et al. (2009) op. cit.
7. HESA figures cited in Stagg et al. op. cit. (2009: 42 & 50).
8. K. Devine (2009) Critical choices for early ecology education. *ECOS* this issue.
9. Stagg et al. op. cit. (2009: 6 para 1.2.2).

10. D. Briggs & S.M. Walters (1997) *Plant Variation and Evolution*. 3rd edition. Cambridge: Cambridge University Press.
11. A.G. Morton (1981) *History of Botanical Science*. London: Academic Press.
12. Stagg et al. op. cit. (2009: 70).
13. A.B. Atkinson (1999) the distribution of income in the UK and OECD countries in the twentieth century. *Oxford Review of Economic Policy* 15(4): 56-75.
14. The phrase 'pyramid of prestige' is originally from the higher education critic Halsey describing the increasingly hierarchical nature of British universities in the post war period.
15. R. Naylor et al (2001) *Sheer Class? The Extent and Sources of Variation in the UK Graduate Earnings Premium*. Coventry: University of Warwick.
16. M. Weber (1925) *Wirtschaft und Gesellschaft* (Economy and Society).
17. Stagg et al. (2009: para 1.2.4) op. cit.
18. L. Gottfredson (1981) Circumscription and compromise. A developmental theory of occupational aspirations. *Journal of Counseling Psychology Monograph* 28 (6): 545-579.
19. e.g. by C.A. Blanchard & J.W. Lichtenberg (2003) Compromise in career decision-making: A test of Gottfredson's theory. *Journal of Vocational Behavior* 62(2): 250-271; N. Taylor & R. G.L. Pryor (1985) Exploring the process of compromise in career decision making. *Journal of Vocational Behavior* 27(2): 171-190; L.J. Millward et al. (2006) "Who am I in relation to work and the job that I do?" *Gender stereotypes and occupational choice in 14-16s*. Poster presented at the Developmental Psychology BPS conference. Only one study of 9 was identified where interests were not always most easily compromised in favour of prestige; B. Hesketh et al. (1990) Career compromise: A test of Gottfredson's (1981) theory using a policy-capturing procedure. *Journal of Vocational Behavior* 36 (1): 87-108.
20. Blanchard & Lichtenberg (2003) op. cit.
21. From UCAS website at <http://search1.ucs.co.uk/fandf00/index.html>.
22. Stagg et al. (2009) op. cit.
23. Stagg P, Stanley J, Leisten R (2004) *Life Study: Biology A level in the 21st Century*. The Wellcome Trust . Available at www.wellcome.ac.uk/education/lifestudy
24. Preference for mammals has been empirically demonstrated – see Wandersee (1986) Plants or animals - which do junior high school students prefer to study? *Journal of Research in Science Teaching* 23(5): 415-426.
25. Stressed by several lecturer respondents in Stagg et al. (2009) op. cit.
26. William of Occam's principle is also the basis of parsimony analysis used in phylogenetic classification of plants and animals. See S. Read (1995) *Thinking about logic. An introduction to the philosophy of logic*. Oxford: Oxford Paperbacks.
27. A. Wolf (2001) *Does Education Matter? Myths about education and economic growth*. London: Penguin Books p. 251.
28. M.J. Atkins et al. (1993) cited in Wolf (2001) op. cit. *Assessment Issues in Higher Education*.
29. The Gatsby Foundation funds an annual Summer School for first year biology undergraduates interested in any aspect of plant science. It has run for 5 years and involves around 80 students annually. See <http://www.gatsbyplants.leeds.ac.uk>.

30. A. Powell (2002) *Athens and Sparta. Constructing Greek Social and Political History from 478 BC*. London: Routledge. p.277.
31. Comprising telephone interviews for this article and the findings in Stagg et al (2009) op. cit.
32. Dr C. Knight pers. comm. 2009.
33. Botanical masters courses without NERC or other studentships struggle to recruit - Jonathan Mitchley pers. comm. 2009.
34. C. Cheffings et al. (2004) *Plant Diversity Challenge. The UK's Response to the Global Strategy for Plant Conservation*. Peterborough: JNCC. Available at: www.jncc.gov.uk/pdf/PlantDiversityChallenge.pdf
35. Spokesperson from the UN Food and Agriculture Organisation, Radio 4, 16.09.09.
36. Stagg et al. op. cit. (2009: 7 para 1.2.6).

Acknowledgements

With thanks to the following for taking part in telephone discussions: Julie Hawkins, Ginny Page, Celia Knight, Jonathan Mitchley, Rebecca Ellis, Stephen Jury, Nicola Hutchinson and Tim Rich. This essay owes much to the ideas and ways of thinking introduced to me as an undergraduate historian by Anton Powell, Director of the University of Wales Institute of Classical Studies.

Clare O'Reilly is a freelance ecologist and trained teacher involved with botanical education in universities and the professional ecology sector. She originally trained as a historian and worked as a corporate lawyer before changing career by doing a botany degree. clare@pyyxis.com

Looking for charophytes on the Northumberland coast dune slacks.

Photo: Clare O'Reilly



Critical choices for early ecology education

Ecology and fieldwork are in decline in our schools. What should be happening in the education system to support ecology in secondary education?

KAREN DEVINE

In spring 2009, GCSE science was highly criticised and significant changes to the GCSE science content and skills are currently being suggested. This follows on from the previous changes to the science curricula in 2006 and 2008 for all students, 11-19 years. These are key years as young people are making their choices about the general areas they would like to explore. If we want to see young people coming into ecology, conservation and associated sciences in the future, it is GCSE and A-level science where we can best demonstrate why these subject areas are important and worth pursuing.

What are the options available to students aged 14-16?

Options available to students aged 14-16 in England and Wales and Northern Ireland for GCSE Science include:

GCSE science, accounting for a single GCSE grade and providing a brief introduction to the areas of science affecting our daily lives. The majority of students are unlikely to take GCSE science without the additional courses.

GCSE science and GCSE additional science, accounting for two GCSE grades and providing a secure grounding in the sciences in preparation for A-Level sciences. Similar to the previous double/dual award science.

GCSE science and GCSE applied additional science, accounting for two GCSE grades and providing context based learning and a greater focus of science and society.

Triple sciences, i.e. biology, chemistry and physics. Incorporating all the respective elements from the science and additional science content above with extra material specifically relating to each field.

What's wrong with GCSE science?

In Spring 2009, the newly formed OfQual (office of the qualifications and examinations regulator) and SCORE (Science community representing education) published two damning reports on the new GCSE science examinations taken by students in 2007/08.^{1,2}

First, the OfQual May 2009 report, highlighted concerns that the assessments of GCSE science did not fully discriminate across the full range of candidates' abilities especially with regard to "How Science Works" and called for a review of the GCSE science criteria to be undertaken by the Qualifications and Curriculum Development Authority (QCDA).

GCSE science should give students opportunities to:

- develop their interest in, and enthusiasm for, science;
- develop a critical approach to scientific evidence and methods;
- acquire and apply skills, knowledge and understanding of 'how science works' and its essential role in society;
- acquire scientific skills, knowledge and understanding necessary for progression to further learning.

The second, SCORE report was far more concerned with the lack of consistency in mathematical demand within science across the various awarding bodies and highlighted that in some cases science did not appear to require any demonstration of mathematical skills.

This supports a recent OECD³ report published in March 2009, comparing top performers in science and mathematics across 57 countries. It highlighted UK students were ranked 8th in science, 16th in Reading and worryingly 23rd in mathematics and below the OECD average.

QCDA's problem

The science and biology criteria are set down by QCDA and form the basis of the studies young people (5-19 years) undertake. It sets out both the knowledge and understanding young people should have and the skills they should be able to demonstrate at each stage of their education.

When it comes to the sciences the QCDA has a problem: the scientific knowledge society acquires is constantly changing and growing in breadth and depth. The content of science curricula must reflect these changes and, to be fair, it does try.

The QCDA relies on input and advice from subject specialists to determine the curricula content and they have a challenge because although the biological community has a clear idea about what young people should know before they reach higher education and graduate, it is less interested in the details like the fact that young people have a limited amount of time to study each subject.

A balance needs to be struck between breadth and depth and, unfortunately, depth has given way to breadth. The casualty is cohesion within the curricula. Biological

content is reduced to a series of topics, each topic designed to give students a brief taste of the various biosciences. It is content with limited context and yet, for a significant majority of young people, learning only happens when its relevance to our everyday lives is understood. This is clearly demonstrated by the report *Life Study: A level Biology in the 21st Century* published by the Wellcome Trust in 2004.⁴

What's hot and what's not in A-level Biology?

This report highlighted that human biology was considered by A-level students to be the most interesting topic, whereas they found ecology, plant biology and food production to be the least interesting aspects.

The same research also found that of all topics covered, students found ecology (predominantly classification and variation, energy flow and nutrient cycling) to be the least important topic studied, although environmental biology (human impacts on the environment, climate change) were considered more important than human biology, which ran a close second. There's an interesting disconnection where two apparently complementary 'topics' are no longer considered as such. This may demonstrate precisely the impact of such fragmented learning on students' understanding of the interdisciplinary nature of science as a whole.

There is little evidence that things have changed, as ecology has taken a nose dive in popularity over recent years; anecdotal evidence linked this to a number of facts including a reduction in fieldwork at school and a lack of relevance to students lives.

The myth of Health and Safety

Fieldwork in science has been in decline for a number of reasons. Health and safety is often quoted as the main culprit but it isn't always the first response a teacher will give when asked why they don't do fieldwork. Geography fieldwork remained a mandatory component of the qualification through coursework and hasn't declined at the same rate as we have seen in science. One would assume there must be reasons beyond health and safety and specific to science to explain why fieldwork has declined. In fact a lack of subject knowledge, equipment and time are frequently highlighted well ahead of health and safety. They are however reasons to be taken seriously.

Teachers' confidence

Is a teacher with a background in biochemistry, genetics or microbiology really expected to be confident about taking 30 or more children into the field and delivering a lesson? There is a tendency to treat biology as a single subject despite the very clear differences between molecular, cellular and whole organism biology. One of the greatest concerns teachers have about fieldwork is their own lack of identification skills in the field, practical field techniques and the likelihood of unpredictable data.



GCSE students investigating lichen distribution.

Photo: BES

Getting the grades?

There is an additional burden teachers face. The British Ecological Society (BES) worked with a number of schools in 2007, developing fieldwork learning opportunities for GCSE science. Students were asked to complete three practical assessments in physics, chemistry and biology, where the biology assessment looked at investigating the distribution of common plants in the school field and associated hedges. Students were not assessed on their knowledge of species but on the data they had collected and the scientific processes. Analysis of the grades obtained by students showed on average that each student maintained a consistent grade between the physics and chemistry elements but dropped on average one grade for biology.

Students struggle to understand the nature of field investigations where some variables cannot be controlled, anomalous results which are not necessarily their fault or the fault of the techniques they have used. A strength of modern science education is that students all have a clearly defined and consistent set of laboratory skills in practical investigations. Its weakness is that outside a few limited laboratory activities they lose their confidence and are more likely to be heard complaining that they haven't been taught the practical activity than they are to be heard complaining about their lack of skills which would enable them to do the practical activity. Fieldwork within biology highlights this weakness as students are faced with solving problems more complex than the highly structured and more reliable physical and chemical activities.

It has often been quoted at many an examination moderation meeting for GCSE and A-level coursework that fieldwork is best avoided as grades are always lower than can be obtained by simpler laboratory based investigations. Coursework is however now a thing of the past but it will be replaced by 'Controlled assessment' for GCSE science.

The future of fieldwork

In November 2006, the Department of Children Schools and Families (DCSF) published its Learning Outside the Classroom Manifesto. Supported by a council and the development of a 'Quality Badge' for learning outside the classroom education providers, there has been a steady stream of increasing interest and promotion of learning outside the classroom. While the manifesto is broad in nature, covering all aspect of the school curriculum, science fieldwork is now benefiting. Following on from the OfQual 2009 report, the QCDA has been reviewing the criteria for GCSE Science and the new criteria which are set for first teaching in September 2011. The criteria remain in the draft version as this article is written but the criteria do for the first time in some years explicitly highlight fieldwork relating to ecological content along with more general reference to field skills as an essential part of science education.

It remains for the science community to ensure that teachers are supported with the professional development and resources to deliver meaningful fieldwork which goes beyond a single day trip.

Ecological content

In 2008 the BES held a workshop⁵ to discuss issues in ecological education with a view to approaching QCDA with the findings and recommendations. The event was attended by ecologists, science teachers and environmental/ecological educators. The workshop concluded that there is less concern with the ecological content of the UK curricula, but how we teach and why we teach ecology needs to be addressed. Where topics such as genetics clearly demonstrate contemporary science and promote discussion of emotive topics such as genetic engineering and the treatment and preventions of disease, classification on the other hand becomes a history lesson and taxonomy reduced to a simple 'making keys' of the school teachers' activity. The poor teaching of classification and taxonomy at school contributes to the decline of students' interest in these subjects in higher education and we are now seeing the effects of a long term steady decline in skills as we have fewer field biologists and lecturers able to identify a significant number of species.

Curriculum content should avoid reductionism of ecology into a few abstract concepts where context is impossible to deliver. Young people are exposed to foodchains and foodwebs at every stage of their education but they are never encouraged to wonder why understanding them is important to interdependence and ecosystems. Similarly most 16 year olds can recite verbatim the carbon cycle in time for the examinations but they wouldn't be able to explain its relevance to biological processes other than a brief mention of respiration and photosynthesis.

There is a need to link humans to the ecosystem in a more positive light rather than as organisms external to and impacting on it. Doomsday messages have branded ecology as a very pessimistic science. The media are full of impassioned references to the end of the world seemingly on a weekly basis.

Ultimately the science curriculum at GCSE is based on 'How Science Works' and is intended to create a scientifically literate society alongside preparing young scientists to take the next step in their scientific careers. Within this context what is it that we really need all young people to understand, what are the skills they will need and how do we best ensure that their teachers have the resources to deliver it?

The BES is currently working with the awarding bodies responsible for the development of the GCSE specifications and assessments to advise on ecological content and assessment opportunities for fieldwork. It seems to come as a surprise for the awarding bodies to hear that fieldwork and ecology can happen even in inner city areas, that it does not require expensive residential fieldtrips. It would appear that it isn't just young people who need the opportunity to see that the natural world is all around us and that there are many opportunities to learn about it even if only on a very local scale. It's a start - momentum has been building recently and the future of ecological education may not be so bleak.

References

1. The new GCSE science examinations, Findings from the monitoring of the new GCSE science specifications: 2007 to 2008. OfQual, March 2009.
2. GCSE Science 2008 examinations, SCORE report, published July 2009.
3. Top of the Class, high performers in science in PISA 2006, OECD 2009
4. Life Study: Biology A Level in the 21st Century, The Wellcome Trust, 2004
5. Ecology in UK curricula, report from the British Ecological Society workshop, May 2008

Karen Devine is Education Officer for the British Ecological Society and is a qualified science teacher. She is working to promote ecology in schools with a specific interest in secondary science. She also works with teachers eg Learning Outside the Classroom manifesto (LOtC). karen@britishecologicalsociety.org

Getting started in conservation - better late than never

With increasing scope for flexible learning and broader volunteer opportunities, it's never too late to think about a career in conservation.

RUTH BOOGERT

I am probably not your typical conservationist. I didn't collect shells, feathers or small insects as a child, I wasn't particularly interested in geography or biology at school and I left university with a degree in psychology and a job in financial services. It took a few years but after a while I began to think that maybe there was more to life than helping the rich stay rich and I started to take more of an interest in charitable work in my spare time.

Of the multitude of problems we face in the 21st century, I felt that some of the environmental challenges were things that I as an individual could begin to contribute to within my ordinary life. I spent a few more years in my job hassling my office managers to take small steps like encouraging double-sided printing and recycling drink cans. The small steps are important, and I don't think being 'only one person' is ever an excuse not to act, but I felt that there was more I could do, and I started thinking about the possibility of a career change.

I was not in a position to simply quit my job and so I started taking evening study courses with the Open University to learn more about environmental issues and took on some part-time volunteering in different conservation roles. Last year I was lucky enough to go back to school full time and spend a year studying on an MSc course in conservation and I am now a PhD student studying how certain habitats respond to long term environmental changes.

I don't really consider myself as having completed the career-change journey yet, although I do believe that I am heading in the right direction because I have confidence that science has a role to play in guiding conservation policy and practice. Looking at my journey so far, I think there have been some key steps which have helped me get to where I am.

Volunteering

I tried all kinds of volunteer jobs from working on 'typical' conservation projects such as habitat restoration, to educational roles, administration support, fundraising and even some website maintenance. These were determined as much by the opportunities that came along as anything else, but also meant that I could mix areas of work which were familiar to me (like managing websites) with areas



NEIL BENNETT

which were not (like wading in to streams to measure water quality) and gain a better idea of the sort of areas I would like to concentrate on in my career. New skills and learning experiences can also turn up in unexpected places; the time I spent greeting visitors to a wetland nature reserve helped me to appreciate the wide range of opinions that could exist on topics which previously seemed clear cut to me. One person's whacky idea is another person's new inspiration. Appreciating and reflecting the moods, sympathies and understanding of the wider public seems to me to be important for conservation organisations trying to effect change at high levels. It is easier to persuade MPs and Ministers to be involved if you can tell them what their electorate think on an issue, especially if a General Election is looming.

A bonus was meeting many interesting and inspiring people, who besides having wonderful stories to share, will hopefully be useful contacts for future employment

opportunities too! People working in conservation also tend to have a lot more to offer than a narrow specialism; they have often pursued other conservation roles in the past and will have extensive contacts outside of their current workplace. Whilst volunteering in the office of a large conservation NGO, I met several other volunteers who were returning from or about to pursue expeditions overseas. Apart from the pleasure of hearing about their adventures this sharing of experience and contacts is another great resource available to the volunteer.

Academic study

The option to study part time was a great way to learn more about the broader issues of conservation without having to take the leap of giving up a day job, and universities are increasingly offering evening or distance learning options. The Open University also offers short courses on topics such as modelling climate change or marine ecology (based on the BBC's Blue Planet series) and courses designed for people returning to academic study after a long break. Financial support is available for low income families.

My MSc course was more of a challenge in that I had to raise money to cover the fees and my living costs. Many courses offer a limited number of studentships but these often place restrictions on who can apply and usually are not available to anyone without a previous qualification in that field. Career Development Loans are another option to meet the costs of full time study, but only defer the problem until the end of the course increasing the pressure to find paid work on graduation. It's a good idea to have a back-up plan, or be prepared to pursue other work if necessary when the money runs out. My solution was a combination of loans, downsizing our lifestyle by moving in to a shared house, and fitting part time work in around the course. My ability to participate in volunteer activities definitely suffered during that period, and I probably could have produced some better pieces of coursework had I not had these other commitments, but I managed to keep my head above water and finish the course, and looking back I can say that the whole experience was worthwhile.

The masters gave me a broad introduction to several aspects of conservation, including basic scientific techniques, an introduction to relevant UK legislation and monitoring methods, as well as an overview of the social, political and economic aspects of some conservation challenges. Visits to several UK regions and opportunities to speak with conservation practitioners in a variety of roles were rewarding experiences which would probably not have been open to me as an individual without the academic calling card.

In the current climate, a big challenge of undertaking further study is the realisation and acceptance that the perfect conservation job is unlikely to present itself at the end of the course. Several of my fellow 2009 graduates have not yet found paid conservation work and those that have are often returning to posts or organisations they held before the course. But nevertheless most are largely positive and with hindsight don't regret their decision to enrol. They consider the

experience and the qualification to still be beneficial in the long run, and feel that being part of a recognised university programme helped to legitimise their requests to participate in conservation programs. The availability of courses in this area appears to be expanding and anyone thinking of investing in the academic route should shop around for a course which best represents their interests in terms of type and location of future work. Also most universities can often put you in touch with past students and it is always worth contacting a couple to gain the insider's view of the course and its contents.

Practical skills

One message that came over loudly and repeatedly from conservation practitioners I met was that there is a decline in practical skills and knowledge in areas like species identification. Such skills are highly valued, and friends who completed their MSc with me have talked about attending job interviews at which they were asked to identify different species of plants and animals. The good news though is that this is one instance where the necessary knowledge can be gained cheaply and easily by any individual. Many volunteer opportunities can provide this sort of education, either explicitly or implicitly, and there are often local groups and societies engaged in recording the regional flora and fauna who would welcome enthusiastic new members. I picked up some bird identification skills whilst helping out with bird counts and started learning to identify plants by referring to a plant guide book and trying to identify species I found on walks. I also took a course with the Field Studies Council (<http://www.field-studies-council.org>) which runs study trips of varying lengths at their national study centres. It was a great way to spend a summer holiday, in a beautiful part of the country meeting friendly and likeminded people and learning a new skill.

Thinking outside the box

I feel very strongly that there are lots of ways to help conservation beyond the typical routes, and career options don't all have to involve spending the day in wellingtons. Conservation organisations need experienced and enthusiastic staff in areas such as administration, human resources, finance, IT, PR and education to name but a few, and this can be an opportunity to use existing skills whilst doing something beneficial and rewarding. I found volunteer jobs managing websites and databases for some conservation organisations because I have existing skills in these areas and they were a route in to the organisation. As a volunteer, such work can have advantages in that it can be done off site and at hours to suit the volunteer, and helps to develop a useful transferable skill.

Several of the students on my MSc course were mature students who were able to combine their existing workplace experience with their new conservation skills to find employment, and it is important to remember that such opportunities exist within the third sector. For example, an ex-teacher is now delivering environmental education and activity programmes in schools, and others with previous experience in policy work are now employed in government

departments. Of course, we need the people who go out in all weathers and look after our natural environment (and if that's your passion then go for it!) but we also need a great many people to generate the necessary income for such projects, manage those resources, lobby for improvements to legislation, spread the word about issues at home and abroad and educate the next generation about the challenges that await them.

Find ways to stay motivated

There have been times when I certainly questioned the wisdom of my decision to move into conservation. The upheaval for me and my family was enormous, we gave up our lifestyle and moved to a new part of the country for me to follow this ambition. Sometimes the long days, poor coursework feedback or our less than perfect housemates had me seriously doubting my sanity. After all, conservation needs money, right? I could have stayed in my city job and modelled myself as the conservation equivalent of Bill Gates (well, a budget version anyway) by donating a generous portion of my pay-packet to worthy causes and done my bit that way.

But I don't think that was going to work for me in the long run. I needed to feel more directly involved and I think that academic work best meets my needs for personal fulfilment and best enables me to work in a line of work at which I can be successful and therefore make more of a contribution. I am sceptical about any claims of career altruism, and that's ok because we need to be motivated to do what we do so there has to be an element of personal satisfaction.

Other things that helped to keep me motivated were taking time out to do other things and recharge, or even putting one of my favourite David Attenborough DVDs on the TV for half an hour. I recommend finding the books, films, people or places that inspire you, and keeping them close to give that extra push when you need it. As my Japanese husband would say: ganbatte kudasai (go for it and good luck)!

Ruth Boogert is a PhD student at Queen Mary University of London. She managed to swap a city suit for a pair of wellingtons but hasn't quite prised herself away from the computer keyboard yet. r.boogert@qmul.ac.uk

UCL Conservation Course 50th Anniversary

The Postgraduate Course in Conservation at University College London started in 1960 and the fiftieth Course is now in progress. To celebrate this half-centenary there will be a party on 2 March, 2010. Any former students of the Course who have lost contact with the College and would like an invitation to the event should contact the current Course Tutor, Peter Jones (P.J.Jones@ucl.ac.uk), Dr Peter J.S. Jones, Dept. of Geography, University College London, Gower Street, London WC1E 6BT.

Getting started in conservation - climbing the rungs of the green ladder

Starting a career in the environmental sector is a scramble of trial and tribulation. Certain factors will influence the chances of transforming your compassion for the planet into a salary, such as volunteering to gain relevant experience, and the appropriate level of education. Beyond this, your continued desire for change and empathy with the natural world can be relied upon to guide you.

ANDREA GEAR

Most of us develop an affinity for nature and have an innate understanding of Gaia years before we know how to address the relationship in scientific terms, or recognise the fragile state we have reduced it to. As a child, planting frogs in my brother's bed and assembling 'homes' for ladybirds on our family allotment, I had no inkling that only 20 years later those same fields would cease to hum with gaudy dragonflies and nectar-intoxicated bumble bees, and that the ponds would resemble spawn-devoid mud-pies. The decision to join the growing movement aimed at reversing the decline in biodiversity by dedicating my adult life to conservation was effortless. Trying to carve a career out of it proved to be as challenging as halting the march of palm oil through Borneo's forests.

limited jobs - unlimited candidates

Getting started in conservation is incredibly tough for the simple reason that there are too many highly educated, skilled, and enthused individuals competing for a limited number of paid positions. This state of affairs is in itself tragic, for if we could harness that excess of passion, drive, and brainpower through employment, and channel it into the UK's educational, political, legal and economic frameworks, we might halve our carbon footprint overnight!

The regrettable reality, is that despite intermittent snatches of government green-speak, the environment is not a political priority, and the restricted funding available caps the employment opportunities in the conservation sector at a relatively constant low. Providentially there are some areas, most notably ecological consultancy, where job opportunities are expected to increase while government acts to halt biodiversity decline and incentivises more sensitive land management.

Conservation jobs range from working as a biodiversity monitor or ecological advisor for a local authority, a fieldwork co-ordinator on an overseas project, an environmental stewardship officer for Natural England, an education assistant for the RSPB, through to a campaigner for Greenpeace. Despite the breadth of careers available, they nearly all require minimum levels of expertise and experience. If

you have already perused the web pages of environmentjob and Stopdodo, undoubtedly you've reacted with consternation at the amount of experience expected for mere foundation level positions.

As a biology undergraduate I recall being exasperated that every environmental job advert listed 'at least two years experience' as an essential criterion, alongside the mandatory degree in a related field. I racked my hemispheres for months wondering how I could possibly survive as a volunteer for two years in order to gain such apparently obligatory experience. Quite frankly, that's not a viable option for the vast majority of us.

Volunteering in the UK: finding your role

One alternative is to set aside a few hours a week to volunteer for an organisation whose aspirations and activities closely resemble those you would like to encompass in a future career. Conservation is analogous to an ecosystem with many different niches and you will achieve the greatest impact working within a niche that makes optimal use of your skill set. The notion of being a countryside ranger and roaming the wilds of the Yorkshire Dales is a romantic one indeed, but if you can't fix a broken-down Land Rover, dislike the noise of chainsaws, and prefer to avoid a 5am rise with the grim anticipation of a disenchanting November skyline then it is not for you!

Thrashing the living chlorophyll out of invasive Rhododendrons or Himalayan Balsam on a Sunday morning isn't the only way to volunteer your time. You can aid conservation organisations in their work by getting involved in fundraising, campaign work, educational outreach, or even technical assistance such as website design. The latter will be particularly valued by the smaller organisations, which don't include personnel dedicated to such specific tasks.

Putting names in your address book

Allocating a few hours a week is a popular option for many clambering onto the first rung, because it is feasible regardless of your current status, whether that be employed, seeking employment, or on a completely inappropriate university course! That isn't to suggest you should prolong this pattern for years until you've accrued the golden 'two years experience'. Encouragingly, it's quite probable that you'll meet like-minded people who have journeyed through the same process and can usher you in the appropriate direction, and it's not unusual for volunteers to be offered a paid position when one becomes available.

Making contacts and becoming known is not an essential part of securing a job in conservation, but it certainly helps. Whether or not this is a 'fair' system is irrelevant; if you are acquainted with those in conservation, whether they are ex-university lecturers, friends, family, or someone you met on a training course, you shouldn't be afraid to approach them. Many job vacancies are filled on personal recommendation, and the field of conservation is no exception to this, so networking within the sector



One of the author's experiences in volunteering: Volunteers at Birdlife Malta's 'Raptorcamp' guard the skies, hoping to give a flock of Marsh Harriers and Honey Buzzards safe passage over Malta with its illegal hunting. Shots were already ringing out in the valley below them.

can be very advantageous. On completion of my BSc I spent the summer surveying bats, a job I acquired by striding boldly into my supervisor's office and enquiring if there were any PhD students in need of field assistants.

Volunteering overseas: relevance and value

If you can spare more than one or two days a week for your volunteering commitments you may consider taking a few weeks or even months out to gain that all important experience. A popular choice for many gap-year students, whether pre or post-university, is to participate in a conservation project abroad. Some of the bigger organisations operating in this sphere are Earthwatch, Coral Cay, Global Vision, and Operation Wallacea. This is an expensive option, e.g. up to £3000 for 10 week expeditions, and such organisations are occasionally criticised for condoning the promotion of glorified ecotours posing as conservation projects.

This isn't to say you should discount the option entirely - I have personally had some very rewarding experiences. But don't expect such endeavours to land you a job, and ensure you choose a project where your time and money will have tangible conservation value, and benefit the local community, rather than lining the pockets of a business. If you are liable to be working in the UK in the future, such expeditions will have negligible merit on your CV. Instead, consider internships,

placements or field assistant work (usually unpaid) with an NGO, local authority, or academic institution. Some consultancy firms and businesses, particularly those that need a dollop of greenwash, may offer graduate training schemes, which are certainly worthwhile if you are considering a route into the private sector.

You should not view the unpaid experience that you need to gain as a chore or a means to an end; volunteering in itself is intrinsically rewarding. During the time I have been involved in conservation, the majority has been on a voluntary basis and I have found it, without exception, thoroughly enjoyable (although thankfully I have a paid job now!). Over the last 10 years I have constructed holts for otters, which were found to be occupied only weeks later, had a close encounter with a mountain lion that was trying to evade bush fires, rugby-tackled hawksbills turtles in order to fit radio transmitters, seen a 20 strong pod of Pilot whales spy-hopping at dawn, scratched a common dolphins fin with a kitchen scourer for DNA, bottle-fed fox cubs, and had a juvenile Milne-Edwards Sifaka lemur vomit on me!

Adding letters to your name

Aside from volunteering to gain experience, you may need to reassess your level of education. Recent years have seen so many highly moulded graduates toppling off the higher education conveyor belt, that a bachelor's degree is now a very commonplace qualification. Many senior conservation positions involve spearheading projects, marketing and funding campaigns, as well as being responsible for staff and resource management, and these will certainly require higher qualifications. To increase the chances of obtaining the kind of job you seek, the acquisition of a masters degree or even a PhD, could prove desirable if not imperative.

When choosing further education, it's important to scrutinize the content of each course carefully. The relevance of modules and value of training will depend very much on whether you want to work in the UK, abroad, in fieldwork or in an office. You may need a course that is UK-focussed, centered on Biodiversity Action Plans, Phase 1 surveys, re-wilding debates and the role of agriculture. Alternatively you may need to learn biodiversity assessments, or laws and policies which are relevant outside the UK. If you are likely to progress into research or consultancy, you probably require further training in statistics and data management systems such as GIS (Geographical Information Systems). Contact the course co-ordinator and enquire as to the specific resources and facilities that the institution offers, and whether they have placements and links to the industry.

Try different soils before putting your roots down

Whatever your chosen route, most of us will follow an evolving career path, rather than hold a job for life. One advantage of this is that you can acquire skills in various places, and it is perfectly respectable to move in and out of the diverse sectors of conservation until you find job satisfaction. You should be prepared to try a few jobs over the coming years, reminding yourself that all experience is helpful, whilst keeping your end goal in mind.

However, if you want to work with 'charismatic mega-fauna', you must be prepared to spend more of your career fighting for a job than fighting to save your chosen species. Wonderful creatures such as the Sumatran tiger or Giant panda are used by conservation organisations as flagship species to inspire thousands to support the cause through membership, petitions or donations. Yet one more graduate pledging to dedicate their life to such species is possibly a waste of an impassioned and educated individual. This is not meant to imply that single-species conservation is no longer valuable, but there is increasing recognition that a more holistic approach to conservation can achieve a great deal more. The global amphibian crisis is just one example of where there is a desperate need for more dedicated conservationists.

Making a difference - it's all in the mind and that first cup of tea

'Making a difference' cannot be measured by the physical changes you witness in the landscape; if you rely on this to keep you motivated you will rapidly become disillusioned. Have faith in the butterfly effect, remaining constantly hopeful that somewhere your actions will have a lasting, positive impact. You can never be certain of your influence, but on the few occasions that it is constructive or sustained, it will have an exponential effect. The 10 minutes you spend explaining to a six-year old why moths give themselves headaches by crashing into light bulbs, may lead to a life-long love of Lepidoptera... maybe.

You can also continue to make a difference outside of office hours. Whilst in most areas of employment you hear the expression 'don't take your work home with you', conservation may be one of the few spheres in which the opposite is likely to hold true. By adopting the conservation ethos in your everyday life, from composting your first tea bag of the morning, to using solar-heated water for your evening shower, you will find progression and depth of understanding in your career comes far more readily.

Finally, it's worth bearing in mind that because competition for jobs, funding and resources in conservation is intense, you will occasionally encounter an attitude that you didn't expect to find in this relatively altruistic field. Don't be disheartened, as this is the exception rather than the rule and you will meet plenty of inspirational, driven, and occasionally delightfully eccentric people prepared to give you their time and advice.

Case Study: James from the Plot

James spent his early years living in a caravan in the countryside, supplementing the family income by working on a nearby dairy farm. Without electricity, he sought entertainment in nearby woodland, turning over rotten logs and scurrying up trees to find slithering, scaly and slimy things. Holding his first snake aged three, and witnessing his screaming sisters scatter in all directions, James knew instinctively that reptiles were for him! However, when aged 13 he announced to the school's careers advisor that he simply "wanted to work with snakes in jungles" he was told no such job existed.

By 15, James and two friends were breeding and trading reptiles from home, amassing a total of 1500. Dropping out of education after GCSEs, he continued farm-work until he had enough money to buy one floor of a derelict hotel for his collection. Taking in injured, sick and unwanted cast-offs from the pet trade, he soon realised that funding the make-shift rescue centre from his meagre wages was not sustainable.

Starting A-level Biology at evening classes, but unable to afford tuition for other qualifications, his old school allowed him to attend Chemistry lessons between farm shifts; he frequently turned up in his wellies! Surprised and encouraged by such support, he next approached the Physics master, who gave him an hour's weekly tuition in return for gardening duties. After A-levels, a contact from the reptile trade gained him a voluntary post at a captive breeding farm in the United States. Soon offered similar work in South America, he was dealing with multiple reptile species in some of the World's densest forests. For James, it seemed like the realisation of a childhood dream.

But for a rather naïve 19 year-old, the corrupt and unethical situation he became embroiled in was pivotal in changing his career direction. He was told that profits from the sale of tarantulas he collected would go directly towards the construction of a captive breeding centre for exotic species of reptile, amphibians and insects for sale in the pet trade, thus greatly reducing demand on wild populations. This was a barely disguised lie, as the specimens were being sold for profit directly into the exotic species trade. James witnessed how greed and corruption running rife result in an appalling cost to native ecosystems.

Unjust, but legal, he observed that most of the illegal trade fell under the radar as the smuggling was by the same large companies which dominated legal movements, remaining unquestioned and free of suspicion. Of the animals caught, handled and shipped in the late 80s to early 90s, an estimated 30-100% died. Horrendous animal welfare issues were swept aside because the trade was so lucrative, a state of affairs largely unchanged.

Realising he was moving in circles too dangerous to be voicing such opinions, and feeling increasingly intimidated, James returned to the UK. Determined to combat the trade he had left, but aware that few would listen to him without some letters after his name, he gained a BSc in Zoology. During his course, James volunteered at labs to assist PhD students, gaining much know-how, including animal tracking and post mortem experience. This secured him research and specimen-handling jobs in natural history film units. He accrued many contacts from pursuing such avenues, and on completing his degree James became a university research assistant. His hard work and enthusiasm brought him offers of PhD options, which he declined, preferring to wait for an opportunity working with his precious reptiles. With a newly developed interest in island ecosystems, he volunteered for a number of island restoration projects.

Although this work remained unpaid, he gathered enough ideas and experience to form a PhD proposal, examining how the handling and shipping of animals



One of James' experiences in volunteering: Volunteers take biological data from an unsuspecting boa constrictor in the previously undocumented forests of the Peal Island Archipelago, in research funded by the Darwin Initiative.

resulted in accidental or purposeful release, with subsequent impacts on native ecosystems. After two years of solid fieldwork, and a one year write up, James completed his PhD aged 29, but realised that unless he continued to pursue his line of enquiry the thesis would be consigned to academia's dusty archives, along with all the other studies which would never be consulted.

So he prolonged what he had started, securing funding to work and train locals on the tropical island of his PhD fieldwork. James impressed the institution he was working for sufficiently to enable the project's expansion, which continues to this day, educating more of the community each year. When he moves on, he hopes his legacy will be a sustainable conservation project, ensuring the survival of some critically endangered endemic reptile species.

For 10 years James made huge sacrifices and worked for little, but now he has government and NGO backing and is proud of his conservation accomplishments. His main advice is to make contacts, ("it's who you know, not what you know to start with"), and take any experience possible, even if it's not directly related to where you want to go.

Useful web links

www.environmentjob.co.uk (within this website click on the useful links tab and you will find lots of other relevant ones)

www.ecoemploy.com

www.growing-careers.com

www.countrysidejobslink.co.uk

www.stopdodo.com

www.acre-resources.com

Andrea Gear is currently contributing to a conservation project on the Mauritius Kestrel. This is the island's only raptor, which, as a result of deforestation, crashed to a population low of 4 individuals in 1974, and was destined to follow one of the island's former inhabitants, the Dodo. Fortunately, 35 years of conservation efforts are managing to sustain the population at around 100 breeding pairs.

The UK Marine and Coastal Access Act reached the statute books in November after several years of intense campaigning from conservation NGOs. The Act places a duty on government to designate a network of protected areas to conserve and improve the marine environment. A new Marine Management Organisation will manage and champion the UK's seas, and marine plans will cover the whole of UK waters so that all activities at sea are planned strategically. Photo below shows wrasse swimming through kelp forest off the south Devon coast.

Photo: www.glendell.co.uk



Going wild

Reconnecting children with the natural world

"The greater the reality of the experience, the deeper its impact and the more precious the moment".¹

FIONA DANKS & JO SCHOFIELD

What ignited your passion for the wild world? Was there a single life-changing moment that opened your eyes to the wonder and excitement of nature? Or were you drawn in over a longer period of time, a drip-drip effect from endless days of freedom, exploration and simply having fun in wild places? Whatever sparked that interest, it probably happened during your childhood. Maybe it was the day you climbed your first mountain or caught your first fish. Perhaps it was seeing a butterfly slowly emerging from its chrysalis, or watching tadpoles trying to avoid a fierce dragonfly nymph in the depths of the garden pond. Or maybe it was the time you were crawling through the long grass playing hide-and-seek, or the hours spent playing with friends in your very own den, or a few moments perched high in the swaying boughs of an ancient beech tree?

Something magical occurs when children and wild spaces mix²

Very young children have a refreshing and untarnished sense of wonder, an insatiable sense of curiosity about the world around them. They rejoice in finding beetles and snails; they run freely when confronted with open green space; they watch amazed as a bee gathers pollen or a tadpole wiggles in a jar; or they simply enjoy splashing through puddles. But in this quick-fix, rapid action, fast moving technological world many children don't have enough opportunities and freedom to pursue their curiosity and explore the wild world. Before the advent of electronic games and wall-to-wall television, many primary age children played outside as a matter of course. They climbed trees and made secret camps, they fished for tiddlers and played forty-four in the woods. They scratched their knees and got dirty; they got lost and then found their way home again; they learnt how to cope with risks, immersing themselves in wild places beyond the adult gaze. And, what's more, they survived to tell the tale and learnt a great deal about life.

Today we find a different story; in the space of just one generation children have become more disconnected from the natural world. A recent Childhood and Nature Survey commissioned by Natural England found that less than 10% of children aged 7-11 play in natural places – compared to 40% of adults when they

were young.³ The National Trust's survey of 3,000 parents across the UK found that for 25% their favourite memory was playing in the park while only 4% said it was playing computer games.⁴ Of course there weren't so many computers around then and of course some children still play outdoors, but the reality is that far too many young people are not creating and inventing their own entertainment in wild green spaces on a regular basis.

Many parents are afraid to let children play outside – for fear of traffic, strangers, accidents, other young people and the unknown. The children are happy indoors surrounded by electronic temptations; research firm BMRB estimates young people in the UK aged between 11 and 15 spend, on average, 52 hours a week in front of a screen; this did include screen time at school.⁵ Leaving the children to entertain themselves indoors is the easy option for parents – it's so much harder to persuade them to go outside and then put up with whinging if they get cold, wet or bored. Some parents even worry about accusations of negligence if they let their children play outdoors out of sight. Another limiting factor is lack of accessible green spaces suitable for playing in; too many children don't have local wild places to explore. Meanwhile, schools have become more cautious about outdoor trips for fear of accidents and litigation. So with fewer opportunities at home and at school, both outdoor play and outdoor learning are being affected.

But does it matter?

There is a rapidly growing body of evidence suggesting that if more children have opportunities to experience the natural world, whether in the garden, in a local park or in more remote places, there should be benefits not only for their health but also the health of the planet. For example, research indicates that free play and exploration in natural areas before the age of 11 is critical in influencing long-term environmentalism⁶ and that there is a strong relationship between frequent childhood visits to woodlands and being prepared to visit woodlands or green spaces alone as an adult.⁷ Hark back to your own early experiences – would you have such empathy with the natural world if you had grown up without some exposure to a range of wild places?

And how about our own well being? A study of the outdoor learning programme "Forest School" indicates that their approach has the potential to benefit the physical health and mental well being of children and young people.⁸ In his report *"Natural Thinking"*,⁹ Dr William Bird presents evidence of the many positive effects that contact with green space can have on mental health and general well being – ranging from encouraging healthy cognitive development and self discipline to reducing the incidence of Attention-Deficit Hyperactivity Disorder (ADHD) and stress to improving concentration and recovery from illness. Experiences with our own families and friends have shown us time and time again how children of all ages can respond positively to being outdoors, exulting in freedom and making the most of the opportunity to explore and have fun. It was seeing these benefits for ourselves, along with an increasing sense of frustration at the number of parents who were anxious about letting their children play freely outdoors, that inspired us to try to spread the



Photo: www.goingwild.net

word. Our own children are now becoming healthy, confident young adults equally at ease in the technological world and the natural world, aware of their connection with and responsibility for the fragile ecosystems on which their future depends.

How can we encourage more children to get outdoors?

Through our Going Wild series of books, published by Frances Lincoln¹⁰, we hope to play our part by providing inspiration and practical ideas for a wide range of outdoor activities. We recognise that wild places stimulate an immense range of responses; there are many ways of 'hooking' people and we must start from where the children are, not from where we want them to be. Some will be drawn in by the wonders of wildlife – but others may be inspired by imaginary games; creative activities and ephemeral art; bushcraft; games using natural materials; storytelling or drama; using the senses; or even just the space and freedom to run wild.

Environmental education and awareness have been an integral part of the conservation movement for many years, but the traditional approach was perhaps too earnest. The tendency was to focus on the conservation viewpoint, teaching about natural history and ecology, usually with a touch of doom and gloom. We need to get away from nature trails and the 'don't step on the grass', 'don't light fires' and 'fill in this worksheet' approach. It's time to stop nagging – let's open the door and celebrate the wild world's endless potential for fun, excitement and wonder. Take an oak tree – an ecologist might tell us how it supports more organisms than any other native tree. But what does an oak tree offer to a child? It can be climbed, or provide a place to hide. The autumn leaves might make a crown for a woodland queen or be piled up into a soft bed to lie on. The galls might make a dye. The acorns might be used for a necklace, while their cups make perfect goblets for elves. Fallen sticks might be kindling for a fire or become the frame for a simple shelter. The list is almost endless, including activities that spark the imagination, develop creativity and encourage exploration.

Giving children the freedom to follow their individual enthusiasms will ultimately lead to more knowledge, awareness and understanding of the natural world.

We believe in a broad-brush approach to wild play and environmental education. Instead of saying “keep off” we should say “come and play”! Of course we need sites where we conserve habitats for the future, but we also need places to engage the conservationists of the future; we can't just save land and lock it up.¹¹ We all need to re-discover our inner child and remember what got us hooked in the first place; were we sitting on the sidelines just watching, or were we getting stuck into a real world experience?

In 2006 the Learning Outside the Classroom (LotC) manifesto was launched – stating that: “Every young person should experience the world beyond the classroom as an essential part of learning and personal development, whatever their age, ability and circumstances”.¹² There are many examples of good initiatives to deliver this both in and out of school settings – for example the National Trust's “Wild Child” campaign¹³ and Natural England's “Million Children Outdoors” campaign.¹⁴ There is the work being delivered by the Learning Outside the Classroom organisation including its Quality badges for sites open for educational visits.¹⁵ The Forestry Commission's report *Growing Adventure* acknowledges that adventure, challenge and even a little danger should be part of the woodland experience.¹⁶ The Forest School movement links schools with local sites, providing opportunities for repeated and sustained experiences to ensure that children become familiar with a site; this approach is surely a much more effective means of reconnection than one single summer adventure on a sunny day. We should also accept that technology is part of twenty-first century life and embrace activities where the two worlds cross, such as through the use of digital photography in the World Beach Project¹⁷ (the use of Global Positioning Systems (GPS) for outdoor treasure hunts, or using mobile phones for various outdoor games).

Is the broad-brush approach working?

Conservation organisations and countryside managers are increasingly offering a range of opportunities on their sites, but are more teachers taking children outdoors to learn in the natural world? And are more parents allowing their children the freedom to explore wild places, to get dirty and have adventures? More fundamentally, is there any evidence that increasing numbers of children are being persuaded to leave their screens behind and get outside? There is a need for further research into the effectiveness of different approaches to environmental education and play, and whether they lead to a long-term interest in and support for the environment. We have seen again and again how easy it is to draw children into the excitement of the wild world, and witnessed the joy in their faces. Common sense tells us that each special wild memory will help to sustain an interest for a lifetime; but we need a more co-ordinated approach to gather evidence to prove these links. Perhaps Natural England could monitor the effectiveness of their Million Children Outdoors Campaign – not just in terms of achieving this target, but to find out how many of those children are engaged to the degree that they want to go back for



Photo: www.goingwild.net

more. Perhaps organisations such as the RSPB, the National Trust, the Wildlife Trusts and the Woodland Trust, already working together through the Learning Outside the Classroom initiative, could work alongside play organisations to explore how children feel about outdoor play and exploration, and how exposure to natural environments affects them as they grow up.

Through our series of books we have set out to provide inspiration and ideas to give people more confidence to get out there; we already have anecdotal feedback from parents and educators who have used *Nature's Playground* as a starting point for outdoor expeditions. One family we met recently told us that a year ago each member of their family spent most of their time in different rooms in front of their own screens, hardly communicating with each other at all. They would never have dreamt of cooking over a fire or letting their children whittle a stick, but after coming across our book *Go Wild* in a local library they were inspired to get outdoors and have had so many wonderful adventures together. We can't assume that parents, teachers and carers have ever had outdoor experiences themselves so we must continue to raise the profile of the need to reconnect everyone with nature. How do we persuade parents and carers to let go a little and move free outdoor play higher up their priority list? As parents ourselves we know how difficult it can be to let go but we also believe that the greatest risk young people face is taking no risks at all. If we can only show children what is possible and convince parents and teachers how easy it can be, perhaps they will all want to have a go for themselves.

In his book *The Wild Places* Robert Macfarlane seeks out lonely mountaintops and distant rocky shores – but by the end of the book he has discovered that true wildness can also be found in the depths of the garden pond.¹⁸ Wildness can be all around us but we have to be prepared to make space for it, to let it in, and to

manage it appropriately while not being too precious about it. Park Managers, local authorities, conservation organisations, play providers and schools should all be working together to ensure that children everywhere have free access to wild green play spaces. And somehow we need to persuade society as a whole that free outdoor play is perhaps the most precious gift we can give to our children.

References

1. Lister-Kaye, J., 2004, *Nature's Child*, Little, Brown
2. Maudsley, M., 2008, Playing Naturally, *ECOS*, 29 (2), 12-20
3. Natural England and England Marketing, 2009, *Childhood and Nature: A survey on changing relationships with nature across generations*, www.naturalengland.org.uk
4. From the results of a survey commissioned by the National Trust, 2009, www.nationaltrust.org.uk
5. BMRB survey, 2007, www.bbc.co.uk/parenting/family-matters
6. Wells, N.M. and Lekies, K.S. (2006). Nature and the Life Course: Pathways from childhood nature experiences to adult environmentalism. *Children, Youth, and Environment*, 16 (1), 1-24
7. Ward Thompson, C., Aspinall, P., and Motarzyno, A. 2008. *The Childhood Factor: Adult visits to Green Places and the Significance of Childhood Experience*. Environment and Behaviour, Vol. 40, No. 1, 111-143
8. Lovell, R., 2009, An Evaluation of physical activity at Forest School (unpublished thesis); *Countryside Recreation*, 17, 1, Summer 2009
9. Bird, W., 2007, *Natural Thinking*. A report for the RSPB investigating the links between the natural environment, biodiversity and mental health. www.rspb.org.uk/Images/naturalthinking
10. Danks, F., and Schofield, J., *Nature's Playground*, (2006), Go Wild, (2009) and *Make it Wild*, (2010), Frances Lincoln Publishers and www.goingwild.net
11. Oliva, C. and Sobel D., 2009, Forts, Land Trust and Conservation Behaviour, *PlayRights Magazine*, 1/09
12. www.lotc.org.uk
13. www.wild-child.org.uk
14. www.naturalengland.org.uk/gettinginvolved
15. www.lotc.org.uk/the-lotc-quality-badge
16. Gill, T., 2006, *Growing Adventure*, Report to the Forestry Commission
17. World Beach Project, Sue Lawty; http://www.vam.ac.uk/collections/textiles/lawty/world_beach/
18. Macfarlane, R., *The Wild Places*, 2007, Granta Publications

Going Wild (www.goingwild.net) is a partnership between Jo Schofield and Fiona Danks; as well as writing books they contribute to conferences and training events and are currently working with Natural England on their Big Wildlife Gardening website.

Looking ahead in conservation

This article reports on the hopes, fears, priorities and predictions of a selection of ECOS readers as they assess the current situation of the nature conservation sector.

ANDREW HARBY

Earlier in 2009 *ECOS* asked some of its readers to offer views on five challenging questions concerning the future of conservation, set out as A-E in the subheadings below. The range of responses from the 27 people we sampled revealed a diverse range of opinions. Here we outline some of the key trends, highlighted by a selection of the many insightful comments we received.

Beginning on an optimistic note, the first question tackled was:

A. What gives you most hope in nature conservation?

A common theme amongst these answers included a positive view of environmental education and a general sense of an increased awareness amongst children and the next generation. On a personal level this is something I have encountered working with children of all ages. Their willingness to engage with the natural environment should be encouraged at every opportunity and is now being promoted in initiatives from conservation bodies and the education sector, including Natural England's One Million Children Outdoors campaign which funds projects that connect children with the natural world. According to one of our respondents: "*when children are given the chance to be in nature, they connect with it unselfconsciously, love it without ceremony, absorb it as it absorbs them.*"

The area that gave rise to the most optimism was the move towards a more holistic approach towards conservation practice and a greater acceptance of landscape-scale conservation policies. A number of respondents suggested a greater willingness towards "*looking at things in larger scales and more connected ways so that it gets closer to whole systems appreciation*". Although, as was raised further during answers to question B, it was largely felt that such management practices had not developed far enough:

"I always thought this is what ecology was about but is not how it is often currently practiced."

Pushing this argument further, some respondents cited an increased appreciation of the place of conservation within both the general public and government planning:

"There seems to be a growing recognition of the interrelatedness of systems and that 'nature conservation' is not (or should not) be a separate consideration but part of the fabric which supports all else."

On this point, some respondents found solace in the economic downturn and suggested that *"a growing recognition that placing economic growth at the heart of all government decisions is a failed strategy"* may signal an opportunity to re-evaluate how society and government thinking views conservation, resulting in greater appreciation of environmental processes.

One respondent believed that this development has shown benefits in both directions. Conservationists were beginning to recognize their own position in society at large, and this confidence was vital to give a stronger voice for conservation while producing a more beneficial outlook for society.

"It seems many of us have finally understood that nature conservation is for and about people and that defining the socio-economic benefits of the natural environment is not some Blairite capitulation to market economics but a recognition that we have to develop a range of arguments to secure the resources we need to achieve our objectives and to do this we need to build a range of alliances. Whilst there are moral arguments for nature conservation there are equally powerful moral arguments for resourcing health, education and other essential components that are the hallmark of a civilized society."

A few respondents placed hope in increasingly robust legislation and the greater understanding of planners and developers about conservation issues which may restrict their own interests: *"more awareness of many conservation issues amongst planners, regulators, land managers"*.

The wide-ranging backgrounds of respondents led to interesting perspectives on the prospects for conservation. A couple of responses with a more geological frame of mind offered optimistic views, with calls for a less short-term view of nature, for example:

"Nature conservation, therefore, seems, from a geological philosopher's perspective, somewhat like putting your finger in a fast flowing river and saying 'stop'. My feeling, therefore, is that we should stop trying to dictate the future, and live in the 'now'."

With this in mind, further areas of optimism included the ability of nature, in the long-term, to adapt and thrive and a greater acceptance of habitat evolution, with *"the overall robustness of nature and wildlife, though not necessarily of the species and communities we currently value"* and a *"growing acceptance of managing for uncertainty with fewer deterministic outcomes"* being examples of common views expressed.

B. What policies, ideas or practices do you challenge most in conservation?

This question received some of the widest ranging and passionate responses in our survey.

Picking up points raised by our first question, there was a greater sense amongst many contributors that 'holistic' practice has not yet become commonplace. Not for the first time Biodiversity Action Plans policy came in for some harsh criticism with a significant number seeking to question the 'reductionist approach' that BAP's spawn. The quotes below are a sample of some of the fears expressed about



NEIL BENNETT

such apparently target-driven psychology, where outcomes set by targets can become the ultimate objective for a given site, at the cost of a broader outlook:

"The reductionist approach to BAP. We seemed to have completely missed the point of the original Rio Convention which was based on the concept of making biodiversity conservation relevant to wider society."

"Prescriptive intervention management for specific species, habitats or narrowly defined outcomes with deterministic end points without consideration of the wider environmental or social context."

"The proliferation of Species Action Plans"

Further, respondents decried the 'static-interventionist' approach towards nature conservation in the UK:

"We are forever trying to freeze nature into its state"

"I challenge the desire of many to take control of nature to achieve predetermined objectives and targets. Nature conservation is surely about conserving nature, and that means allowing nature to do its own thing, going the way nature wants to take us."

"The idea that we believe that we can choose what nature should do."

"Conservationists need to understand that changes to, in and by nature will take place and these need to be facilitated, not stopped."

Many felt that the rigidity of such thinking reinforces a dated ecological concept of ecosystems in equilibrium, maintaining and strengthening the boundaries between different habitats or managing a site purely for the benefit of one marginal species. It was thought that a greater diversity could be achieved with a more fluid approach to conservation management.

Target-driven thinking may be seen then as a consequence of 'corporate' influence on nature conservation. Conservationists now have to make convincing cases that money given to them can develop specified outcomes in certain time-frames and provide for greater accountability. This has produced a trend towards 'systematic conservation planning'.

On a related theme, and developing an argument recently advanced by the BBC wildlife guru Chris Packham (and largely misinterpreted) in the national press, the need for triaging our approach to species and habitat conservation was raised:

"So much conservation effort and expense is based on conserving very rare species which are on the edge of their range in the UK, and are adequately secure elsewhere. This is a stamp-collecting mentality in which the important species in functional ecological terms absorb excessive resources from safeguarding the habitats and more typical species which are key to ecosystem function."

"The idea that we need to concentrate our efforts in specialist places (reserves) and that the rest isn't important. If the rest of the countryside wasn't in such a dire state more people would benefit."

This was again addressed by several people in the final question: 'What will conservationists argue amongst themselves about most in 30 years time?' endorsing the view that both here and overseas, conservationists will soon face some very difficult choices.

Species re-introductions made a number of appearances in people's answers with some questioning *"the refusal to countenance species reintroductions to these islands when it would help restore some sense of wildness to the UK"* and *"why should people in India have to put up with tigers when we agonise for years over bringing back the beaver?"* Although support for this topic was not universal with some challenging *"the re-introduction of species into a now-alien environment and the assumption that this is a 'panacea for all ills'."*

Some raised objections regarding the mentality of the conservation community when dealing with other sectors and the general public and questioned what they saw as *"A dumbing-down of conservation messages to the public in the belief that this is*

what they need to hear in order to support conservation." Another contributor also talked of *"The elitist scientific agenda pursued by some. A sense of arrogance amongst the conservation community that we know best"*. The constant doom-mongering of many (although this is partly a product of media hyperbole) was also highlighted as liable to increase dissociation with the general public and lead to desensitisation towards new issues.

This exclusionist approach is also thought to extend into the area of reserves and site management with questions raised over the *"presumption that public access and nature conservation are incompatible"*. In contrast, one contributor expressed *"real concerns that the public access to conservation areas agenda which dominates Natural England and Defra is not being monitored, and should be reconsidered for at least some times of the year."*

C. How is conservation perceived from the outside, by other professions and sectors?

Responses here revealed the wide background of our contributors:

"(conservation is) a plaything of an affluent society."

"Strangely, a subject which generates massive viewing figures on TV is at the same time regarded as a marginal special interest."

"as reactive rather than proactive; as parochial rather than open-minded."

"an amenity rather than nature being seen as the fundamental asset that underpins our survival and well-being."

"Sometimes with a fortress mentality."

Many of the common themes expressed see the conservation movement gaining recognition amongst policy makers and business interests, but still failing to shake its stereotypical image:

"In my lifetime they have moved from amused tolerance or derision to grudging acceptance that there are ecological imperatives which sit alongside economic and social imperatives. There is of course increasing irritation that conservation now really does get in the way of what others see as necessary progress."

"In the case of the construction and business sector (conservation) is perceived as a barrier to progress."

Many expressed the view that conservation is seen as an annoyance and at best something to make a token gesture towards in order to enhance PR and public perception. Indeed, it seems to be a common belief that many promises currently being made by corporate and government interests may be less substantial than

would at first appear, or as one writer suggests: *“those in opposition will commit time and apparent support, but this will evaporate when they are in power and faced with more urgent and pressing electoral priorities.”*

Much of the political and corporate manoeuvring towards what many see as ‘greenwashing’ can be seen as a direct result of the promotion of the green sector’s marquee issue, climate change. Amongst members of the public, it has become particularly apparent that an over-emphasis on climate change and mitigation, though an important issue, has obscured nature conservation efforts:

“Climate Change, renewable energy and carbon reduction have overtaken nature conservation as the core of cutting edge environmentalism.”

Though more accepted, some see the conservation movement becoming more isolated from the general public through its use of exclusionist phrases and language where a more straightforward idiom could be utilised:

“Professionally, it is now part of The System, though everything gets befuddled by the increasingly convoluted and insular language of nature conservation and environmentalism, which is now hybridising with governmental policy-speak.”

Picking up on the calls for a more fluid and adaptable approach to land management, one contributor believes the perception of the conservation movement amongst some land managers may be tainted by this inability to correctly identify and develop sites in a wider environment:

“When productive forest is felled to try to re-create heathland, whilst many thousands of acres of neglected heathland abound nearby, practical land managers inevitably question the logic and the sagacity of those involved.”

D. How can conservation become more influential in policy making?

A number of respondents advanced similar opinions in response to this question, advocating a mingling of conservation ethic with other sectoral interests, in particular agricultural, in order to further enhance the influence of conservation in policy making:

“We need to engage more with other sectoral interests particularly those such as health and education which are also delivering public goods, and articulate compelling arguments for why our worldview matters to them.”

“By behaving less as self-righteous, battling outsiders who ‘know’, and working more to instil awareness of nature amongst other professions. By building an ecological literacy into health, education and economic policy, manifested in the people within those sectors, themselves.”

“In particular conservation needs to become part of the debate on adaptation to

climate change and on food security and work within agriculture rather than being seen as oppositional or separate.”

“We need more genuinely concerned, effective and ecologically literate people working in all sectors, particularly government, planning education etc”

“Get truly conservation informed people installed in all levels of all organisations in apparently unrelated areas of responsibility.”

Others also recognised that in order to be involved in policy making, conservationists must be prepared to compromise to some extent with other interests:

“If we want to engage in real policy making we must accept the responsibility that comes with having that power: We may have to contribute to and accept hard decisions which will often involve compromises; they may end up being wrong, but someone has to do it. If we don’t like what others decide we have to be part of the process.”

Some recognise that the idea of compromise should not hold such negative connotations, and that progressive solutions can still be attained:

“Looking for win-wins and understanding that compromise doesn’t always set a negative precedent. (Compromise with agriculture etc).”

Responses to this question were generally the shortest, perhaps reflecting the difficulty many conservation professionals face in pushing forward the interests of their sector and influencing policy development.

E. What will conservationists argue amongst themselves about most in 30 years time?

Most respondents felt the most likely problem facing conservation and the planet as a whole over the next 30 years would be overpopulation. Though some, mainly developed, countries are beginning to show a slowing population growth rate, the global population is expected to hit 9 billion by around 2040. The associated problems of a 50% increase in the population will certainly affect conservation practices. Many responses reflected this when asked to consider the chief source of anxiety amongst conservationists over the next 30 years:

“That population growth will be centre stage rather than a taboo subject. And of course there will be more discussion of competition/conflict between conservation interests and the need to grow more food.”

“How on earth to save some last precious remnants of global ecosystems in the face of overpopulation, environmental destruction and mass migration.”

“Pressure of climate-change immigration and increasing population.”

"That the conservation movement must confront the overall problem of overpopulation. Without halting the growth of the human population, all conservation efforts are doomed in the end – they are merely a conscience palliative."

"Doubtless the same pirouetting on the head of a pin as happens now. And most likely, for all the ground we've gained, we may well be arguing over how to protect wildlife from the re-advance of intensive food and energy crop production, as pressure for more domestic food generation mounts."

Other respondents concerned themselves with issues closer to home, revisiting a number of the themes raised earlier in the survey:

"Why we spent so long writing action plans and so little time taking action."

"Why did we ever think of re-introducing large animals like beavers to the British Isles when other countries are spending a fortune to try and get rid of what is now, an alien species?"

"Who was responsible for not doing enough to conserve our fish stocks?"

Whilst one respondent, perhaps with more experience of the frequently changing values and theories of the conservation movement, offered this succinct answer:

"Almost certainly nothing that is put forward in answer to this question!"

Hopes and fears...

It is heartening that many people felt conservation is moving in the right direction, although perhaps not as quick as most of us would like. However, perhaps in the short term for economic reasons and in the longer term because of diminishing resources and a new emphasis on national food security, the measures that many respondents called for stand scant chance of success. Indeed, worries that changing priorities will sideline the conservation movement were frequently voiced. Some people who accepted this premise pointed towards a more focused effort, or combining forces with other sectors.

Climate change was unsurprisingly an issue tackled by a majority of contributors and one where people generally fell into two camps: those who saw climate change concerns as encompassing the conservation movement and thus answered many of their questions in these terms, and those who separated their values from climate change whilst acknowledging the impact that it will have on conservation. Some see the over-arching issue of climate change as a hindrance, as all conservation efforts become defined with respect to their climate change impact. Some people were also concerned that the world of carbon offsetting would overtake conservation concerns, while others noted how climate change can be used to strengthen their position in influencing policy and how in some cases its huge political weight can be used as a lever, allowing other issues to be raised.

A particularly resonant issue was the need for the conservation movement to view itself in a wider context. This thinking applied both in a practical and in a strategic sense. Thus contributors suggested individual sites should be seen in a wider context, that there should be a more comprehensive approach to management, and that successional habitat transformation should be more accepted. People also called for a broader scope in conservation's influence within policy formation. It seems many conservationists view themselves and the wider movement as too wrapped up in the minor details.

Perhaps the hardest question from which to pick out any single theme was our final one. I think it is perfectly in character for conservationists to be more than somewhat disordered in their view of the next 30 years, although it is safe to guess that everyone is certain of one thing: we will all still be arguing...

Thanks to the following for taking part and offering their personal views:

Michael Jeeves, Mick Green, Peter Donnelly, Duncan Mackay, Peter Shirley, Tony Whitbread, Philip and Myrtle Ashmoles, Matthew Oates, Mike Townsend, Peter Massini, Gareth Morgan, Dan Puplett, Euan McPhee, Jim McAdam, Alison Parfitt, Andy Tickle, Peter Townsend, Pippa Langford, John Barkham, David West, Ian Baker, Keith Kirby, Emma Ireland, Sue Everett, Alex Mitchel, Steve Head.

Andrew Harby is a recent MSc Conservation graduate and is currently taking part in a graduate trainee scheme with the London Wildlife Trust. A_harby1@hotmail.com

Coast path audit: The new Marine and Coastal Access Act allows Natural England to coordinate new coastal routes, secure permissive paths, and replace the 13% of coastal paths expected to be lost to coastal erosion in the next 20 years. Walkers shown here are on the south west coast path above Durdle Door in Dorset.

Photo: www.glendell.co.uk



An all-consuming passion

BANC was established at the beginning of a period of economic liberalisation and rampant consumption. Three decades later, environmental issues are better understood, but the Planet is in worse shape. Are there grounds to be hopeful for our future?

JAMES ROBERTSON

Keeping upbeat

At a recent biodiversity conference, a local councillor opened her talk with the words *"It is too late for pessimism"*. The sentiment behind this, that there isn't time left to waste energy being gloomy about the future of our Planet, is unarguable. Better the futility of misplaced optimism than the sterility of worthy pessimism. Never give up hope; if nothing else, it is attractive and motivational, where gloom is precisely the opposite.

Looking back over the three decades since I attended the launch of a shiny new conservation organisation called BANC, several themes come into focus. One is a greater appreciation that human impacts on the environment operate at all scales; the bigger the impact, the greater the kick-back. Pull away at the safety net of the biosphere and it will unravel. This is an ecological lesson; we are connected to the living biosphere, which we rely upon and which in turn depends on us; we are in this together. This leads to another theme, about our relationship with nature. Are we part of, or apart from nature? This in turn raises questions about ethical and spiritual motivations, as well as less abstract, more everyday considerations about the way we live.

We are living in an age dominated by economics and consumerism. So here is another theme, that of economic growth and the search for sustainable lives. The post-war theme of food security has re-emerged, this time embracing the local, seasonal and sustainable. Underlying all these is the great black cloud that hangs over the planet, and which for nearly three decades few commentators have dared to speak about: human population growth. This is, in the current idiom, the elephant in the room. Talking of which, there is something positive to report about elephants.

Finding space for other species

In the run-up to the Earth Summit in Rio, *The Independent* newspaper devoted its front page to a set of depressing statistics, under the heading 'This Troubled Planet'.¹ One of these was the decimation of the African elephant population, down from just under two million at the time of the UN Conference on the Human Environment (known as the Stockholm Conference) in 1972 to a mere 600,000 in 1992. This was part of 'a wave of extinctions unprecedented since the last Ice Age'.

Most current estimates suggest that the drop in the African elephant population has levelled off. Indeed in some countries, such as Uganda, the elephant population, along with other large herbivores, has increased, drawing in more tourists and thus benefiting the local economy. This sounds like a good news story, but as always there is a mass of issues underneath the surface, including the real nature of 'green tourism'.

In 1972 the fate of the great whales was all but sealed. A proposal for a moratorium on commercial whaling was passed at the Stockholm Conference, but it took 10 years before Governments were ready to support a ban by the International Whaling Commission. Since then, the ban on whaling, although compromised by whaling nations like Japan, has brought about improvements in global whale populations which cetacean-watchers would hardly have dared to hope for. Blue whale populations have recovered from a low-point of less than 1,000 individuals, although at about 5,000 individuals, they are not yet out of trouble. The ban on hunting humpback whales in the north Pacific in 1996 has had a more dramatic effect. The population, which may have been as low as 1500, by some estimates has climbed to nearly 20,000. Other whales have not fared nearly so well, but the point remains that humans operating collectively in the interests of other species have been able to turn around what once appeared to be a hopeless situation.

Biodiversity at home

Closer to home, conservation has moved into a well-funded, publicly supported phase of plans to conserve rare species and re-introduce ones which have disappeared. The media love stories about Dormice projects, Water Vole releases, and reintroductions of everything from Red Kites and Ospreys to Large Blue butterflies and Beavers. These projects call for careful monitoring and high quality science, allied to media-friendly enthusiasm and volunteer participation. They help cement the idea that a wildlife-rich environment is a general good, like the health service or education, to which we can all contribute and from which we can all benefit. The smiling face of conservation action pleases everyone, including target-hungry politicians, and grows memberships, tourism and economic activity generally.

Much of this activity has arisen from the Convention on Biological Diversity (CBD) which the Parties signed at the Earth Summit in 1992. This was the moment when 'biodiversity' became the politically acceptable name for nature conservation. As well as the benefits for conservation, there have been some widely acknowledged weaknesses in the way that the Convention has been implemented. The UK 4th National Report to the Convention² earlier this year put it succinctly:

"More needs to be done to communicate effectively about what the Convention aims to do. The term biodiversity is not well understood and there is a perception that the Convention is mainly about conservation of threatened species, and not about maintaining the global life-support system for the benefit of all people."

Let us work to get rid of that perception and speak up about the importance for humanity of biodiversity. As the Millenium Ecosystem Assessment puts it: *"the complex systems of plants, animals and biological processes...make the planet habitable...Protection of these assets can no longer be seen as an optional extra...We must learn to recognise the true value of nature – both in an economic sense and in the richness it provides to our lives."*³

Our relationship with nature is at the heart of 'biodiversity action.' Conserving species and habitats *in situ* is vital, but it needs to be done in concert with others, not as a narrow, sectoral activity. Thus I would like to see conservation organisations working closely with farmers and landowners to develop practical ways to farm and maintain habitats as a joint objective. We need livestock to manage habitats, and the consumer wants to buy meat from healthy, well cared-for animals with a story to tell; habitat management is part of the provenance of the animal. Organic systems are beneficial for nature, so let's forge closer links with organic farmers and certification bodies. Specialists, bound up with their subject, may lack a natural ability to see the bigger picture, but there is no reason why those in charge cannot show leadership and imagination.

Filling in a hole

Having positive stories to tell about our relationship with nature creates a climate of possibility. This is equally true at the macro scale. Nothing has had a more helpful effect on the climate change debate than the story of the ozone layer. Chlorofluorocarbons were first produced in 1928, and had various commercial applications, most notably as propellants. Within 50 years production had reached one billion kg, and concerns were growing because they were known to break down ozone in the presence of UV light. Moves to limit their use began as early as 1977, but the discovery of the Antarctic ozone hole in 1985 made the case for a ban much stronger. International cooperation was an important feature of the story, as was the strong public support for a ban, marshalled by campaigning groups like FOE.

If you set aside the detail, such as the fact that the hole has not disappeared, and that the affected manufacturers bitterly fought the ban, even though substitutes were cheaper, the lesson is clear. Humans can heed good science and recognise when their actions harm the planet, and can get together to sort out the problem. Give us the evidence, is the message, and we will act.

The vested interests behind CFC production were relatively modest ones. The producers of carbon dioxide and other greenhouse gases are hugely influential, and have enormously powerful allies. Energy consumption is allied to national wealth, which in turn is a measure of strength. It will take a great deal of determined effort to make serious cuts in carbon emissions. How long before a dependence on polluting and finite fossil fuels is seen as a measure of economic weakness?

Three decades ago, the publication of the World Conservation Strategy⁴ provided a route map towards sustainable development. The reasons why conservation was



Harnessing local resources: A 36kW Hydro generator, owned and operated by the community installed at Talybont reservoir within the Brecon Beacons National Park.

Photo: Stephen Shepherd

crucial to human survival and had to become part of the development process have never been more clearly spelled out. The UK response to the Strategy, published in 1983 takes issues like energy and climate change much further, and many of its predictions have proved accurate.⁵ In the UK response to the World Conservation Strategy, Brian Johnson wrote: *"there is general consensus among the scientific community that the Earth's whole atmosphere is slowly warming up... Climatic modifications may turn out to be the most dramatic and far reaching of the changes that people are bringing to their environment"*.⁶ At that time, its significance, *"like a hairline crack in a dam"* was difficult to interpret. He was writing more than a quarter of a century ago.

Hydropower, of course, is one of the renewable sources of energy which are viewed as solutions to the problem of carbon emissions from oil and coal based power stations. Yet dams as development solutions have a terrible history, destroying landscapes, erasing cultural heritage and displacing communities. Climate change is a symptom. It is no solution to shift our environmental impact from carbon production to something else equally damaging to the World Conservation Strategy's three essentials for human life: the maintenance of ecological processes and life-support systems; the preservation of genetic diversity; and the sustainable use of species and ecosystems.

An interdependent relationship

These are utilitarian arguments for conservation, and environmentalists have learnt to avoid images of beards-and-sandals tree-huggers communing with nature. Yet

powerful non-material emotions shape human belief and behaviour. These include cultural identity and nationalism, ties of family and friendship, religion, social obligations and also, significantly, calls upon us from beyond our own species.

I own up to being a believer in what Edward O. Wilson called 'biophilia', at least for myself. This describes an innate attraction humans feel for other forms of life, or in simpler terms, a love of nature. In his book *Biophilia* Wilson expands on this: "To explore and affiliate with life is a deep and complicated process in mental development. To an extent still undervalued in philosophy and religion, our existence depends on this propensity, our spirit is woven from it, hope rises on its currents".⁷

The trajectory of my own life has been defined by this propensity, so that it seems inevitable, almost genetically determined. As a child of four I had a hopeless dream that I would one day have a farm populated with cows and sheep, chickens and pigs. The incentive was contact not only with farm animals; I was just as enthralled by the sound of bats, the colour of poppies and the shape of mushrooms. An endless succession of vivid encounters with animal and plant lives lead to a job filled with opportunities to 'explore and affiliate with life', and on to the daily chores and pleasures of my own small farm looking up at the mountains of Snowdonia.

I once had a go at explaining why people, to a very variable degree, are smitten with other life forms and the beauty of our green Planet Earth.⁸ I suspect that we may be, to use a rather ugly term, 'hard-wired' to identify pattern in the world around us from birth; it is essential for our survival that we learn about the colours and shapes of the fruits we can and cannot eat, and of the way that nature works around us, and that we should be rewarded with a sense of pleasure and achievement as we succeed in this knowledge. The same kind of evolutionary benefit for a highly social species with an awareness of its own mortality may explain why humans wherever they live feel compelled to establish a religious framework for their lives. Religions have much ground to make up before they become a benevolent force for reconciling humanity and nature.

I don't think we have nurtured our instinctive love of nature as we should, but it is there in us, a deeply rooted source of hope, the sense which enables us to bear witness to the beauty around us. Also in *Biophilia*, Wilson remarks: "*Without beauty and mystery beyond itself, the mind by definition is deprived of its bearings and will drift to simpler and cruder configurations.*" Nature gives us our bearings, roots our lives, and gives them meaning.

Out of Africa

Some people like to dismiss such arguments as the luxuries of a well-fed, affluent society. Yet it is the rural poor in parts of Asia, Africa and South America who stand to lose most from a breakdown in that relationship. These are more victims than instigators of desertification and deforestation, rising temperatures and sea levels and diminishing food and water resources. Yet the impact of large numbers of people on their environment is undeniable; Kenya's big cities now have a

hinterland of up to 100 miles of treeless land, as charcoal gangs cut down the trees, convert them to charcoal and sell them to meet the rising demand for cooking fuel.

In *The Challenge for Africa* the Kenyan Nobel laureate Wangari Maathai dissects the causes of corruption and bad governance on the continent.⁹ These stem in large measure from colonialism and arbitrary Country-making which destroyed traditional tribal affinities and broke down their intimate relationship with nature, an accumulated knowledge and wisdom built up over millennia. The breakdown of their cultural and spiritual heritage has left Africans alienated from their environment and this she identifies as being at the root of Africa's environmental problems. Her answer has been direct action, the empowerment of women, and campaigns against corruption which have seen her jailed and beaten up repeatedly.

Wangari Maathai's Green Belt Movement has planted 35 million trees, rebuilding a practical and spiritual relationship with nature. Putting the forest back, and re-establishing the broken link between ecosystem and people, offers a model for Africa and lessons for the world. Rich nations need to play their part, for example by supporting the UN Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD for short). Pressure groups are vital too; an example being the striking success of Greenpeace in getting four of the largest food companies to agree not to buy beef raised on land cleared from Brazilian rainforest.

Looking out for growth

A finite and fragile environment places a barrier in the path of conventional economic progress. Neo-liberalism has had free rein over the last three decades, and this means that barriers to economic development must be dismantled as an article of faith. Logging companies which locate reserves of tropical hardwood and strip them in a process more like mining than harvesting, are benefiting the market, keeping down the price of raw materials. Governments give them permission and take the income, bypassing the people whose environment is being despoiled. In a climate of economic liberalism in which timber is just a commodity, the market will always find the cheapest supplier, even if there are regulations in place which are supposed to stop this. All that happens is that a premium is added to 'sustainable' products.

In this way, the UK consumer is a party to global environmental destruction. By relying on global commodity markets and avoiding the domestic pollution associated with manufacturing industry, the Government can claim to be meeting environmental targets. Thus we export our emissions to countries like India and China.

Bill Adams gave a forensic account of the way in which conservation organisations have become embedded in this consumer economy in the previous edition of *ECOS*.¹⁰ Neo-liberalism is the new mindset, and its influence is all-pervasive. Nature conservation has been re-packaged as a consumer product, and uses the language of the market. Nature provides ecological goods and services,

and conservation is sold as part of the 'sustainability' agenda – as a means of keeping the economic show on the road. We are, in his words, *"Tying our attempt at a solution to biodiversity loss to the very processes that drive it"*.

Adams argues that consumption distances the consumer from the experience of nature. Yet all those inveterate buyers of bird feed and nature holidays are financing the organisations which are looking out for wildlife. Should these organisations try to extricate themselves from activities which encourage the false idea that perpetual economic growth is possible in a finite world? What will they do to keep projects and staff afloat if income falls as a result?

The benefits of a switch from consuming more to consuming better – smart consumption for greater fulfilment – need to be articulated with great urgency right now. Political leaders will not stray far ahead of public opinion, but there are grounds for thinking that they won't lag far behind either. It is surely time to argue for a change of gear, slowing down on the volume of consumption and developing new ways of meeting human needs within environmental limits. Such an approach, with its call for human ingenuity and a re-discovery of the things that matter, looks more exciting to me; here is a reason to be optimistic about the future facing the next generation.

Less is more

I would also be cautiously optimistic that conservation organisations can change their behaviour to reflect this argument that 'more is less' without seriously weakening their effectiveness. So much of the activity which I see around me is really pretty vacuous anyway. It would not be politic to single out particular organisations which put huge effort into achieving no discernable conservation outcome, but I am not thinking only of the statutory Conservation Agencies here. It is human nature to spend time on dubious but enjoyable research and in endless meetings and dialogue with 'partners', safely within comfort zones. Effecting conservation on the ground is difficult, and involves persuading people who aren't versed in the language of conservation to do things differently.

By contrast, a great deal is being achieved by some quite small conservation organisations and by individuals. In some cases this is down to networks of individuals with a 'ways and means' mentality. It takes energy and commitment, but it is possible to make a visible difference to the fortunes of nature. There is great satisfaction in tenaciously pursuing a conservation goal, ignoring all distractions, and finding common ground with those able to influence the way land is managed. Many people are sympathetic to nature and there is a natural alignment between issues like food and nature security, organic farming and nature conservation and between traditional management practices and the small-scale, sustainable use of natural resources. In UK conservation, sympathetic people can be a more powerful resource than inward-looking personnel. There are many excellent examples of the proposition that less can, indeed, be more.

These arguments can be applied to food production and manufacturing; think of William Morris and the Arts and Crafts Movement, which celebrated artisan skills and the beauty of design in function; or E F Schumacher's classic *Small is Beautiful*.¹¹ There is beauty and function in an artisan cheese or a hand-made chair. We may also find these two merits in small family size; dare I suggest that when it comes to population growth, less is also more.

The elephant in the room

When *the Ecologist* magazine published *A Blueprint for Survival* much was made of the few paragraphs devoted to population.¹² Then, as now, it is controversial to suggest that too many human babies are being added to the global population each year. There are plenty of educated citizens in rich countries who would dispute that there was a problem, or in some cases urge that families should have more babies, on economic, religious or ethnic grounds (although they would keep quiet about the ethnic motives).

Yet climate change is bringing this issue into focus, not just because of the demands on the Planet and carbon emissions which rapidly rising human numbers create, but also because rising sea levels will displace millions of people, leading to a wave of economic migration which may prove uncontrollable. This is an issue where women are the key. Studies have repeatedly shown that where women are educated and empowered, they reduce the size of their families. When David Attenborough is willing to speak out, noting that the human population has trebled in the time he has been making wildlife documentaries, then the time for a grown-up debate about limits to population growth may be at hand.

Food security

I started my career working for the Agricultural Research Council when food security was still an issue, shortly after publication of the White Paper *Food from our own Resources*. Research was geared to maximising production, but in a narrow way – there was no apparent coordination between, for example, Plant Breeding Institutes and Plant Health ones. Thus higher yielding crops were produced without concern for disease susceptibility, or flavour and nutrition, for that matter. It was a blind policy which ignored the impacts of intensive food production on the countryside, the imported inputs which such production required, the damage done to the real food chain – the traditional links between small-scale producers and their customers – and the laws of supply and demand. It was an insight into how narrowly Government policy was and is interpreted by Civil Servants and functionaries.

There is now a new Food Security movement, helping to re-build links between producer and consumer, to see nature as a vital part of agriculture, and to value quality above quantity. It is a reaction to industrial, commodity food production, with all its inherent waste.

One of the lower estimates of waste is that 3.6 million tonnes of food worth £9 billion is thrown away in England and Wales every year. Most of it is untouched, and it includes 5,500 whole chickens which are sent to landfill every day. Supermarkets encourage over-purchase with 'Buy three chickens for £10' offers, so the cause of this scandal is not a mystery. It is still truly shocking that more than two million battery chickens live short, brutal lives every year for no purpose.

Industrial fishing techniques which damage the seabed and regimes which lead to huge discards of dead fish are equally wasteful. Nearly a third of seafood fish species have declined to less than 10% of their original yield because of the collapse of their stocks. Overall catches have been in decline for 10 years, because the fish are no longer in the seas, even though fisheries have greatly expanded the range of fish that they catch.

Vested interests are using climate change and a rising population to argue that we need to return to a policy of maximum food production. The real challenge is to cut out waste, reduce pollution and find new ways to optimise food production. Organic farming has much to contribute; consumers understand that not every carrot has to be straight, and, valuing organic food, waste much less. Compared to the situation 30 years ago, people are now much more interested in what their locality has to offer - its food, its landscape, history and nature - and I find this encouraging.

An enduring vision

The vision which was embodied in the famous Command Paper 7122 which established the framework for nature conservation in the UK is still relevant. There has to be a place for nature in a civilised society. The global environmental crisis is deepening, and there is no end in sight to environmental problems: excessive waste and consumption, pollution in all its forms, deforestation and desertification, the spread of invasive species and of uniformity, the loss of biodiversity as rare species become extinct and common species decline, and the rising human population.

There is no point in being disheartened. Other great issues of concern to human beings, such as poverty, conflict, oppression, starvation and disease, are still rampant, despite all the efforts of people of conscience to resolve them. We can only do our best.

At the very least, those of us who have been blessed with a passion for nature will have derived great joy from experiencing the natural world beyond us, of which we are a part. Bound to my small farm, which provides a continuous encounter with both life and death, I am constantly bewildered by my good fortune to be alive. I have nature to thank for that, as do we all.

References and notes

1. *The Independent* 3 June 1992
2. www.cbd.int/reports/search/
3. Millenium Ecosystem Assessment Living Beyond Our Means: Natural Assets and Human Well-Being
4. World Conservation Strategy IUCN-UNEP-WWF 1980
5. The Conservation and Development Programme for the UK (1983) Kogan Page
6. Brian Johnson (1983) *The Conservation and Development Programme for the UK – An Overview*, Kogan Page pp23-24
7. Edward O Wilson (1984) *Biophilia* Harvard University Press
8. James Robertson (1993) Nature's story *ECOS* 20(1) 39-45
9. Wangari Maathai (2009) *The Challenge of Africa* Heinemann
10. Adams, B (2009) Conservation and Consumption *ECOS* 30(2) 2-9
11. E.F.Schumacher (1973) *Small is Beautiful – a study of economics as if people mattered* Blond and Briggs
12. A Blueprint for Survival (1972) *The Ecologist* Vol 2 No 1 January 1972

James Robertson is a writer and organic farmer. He edits *Natur Cymru*.
jamrobertson@gmail.com

Photo: www.glendell.co.uk



Where now 'Hell and High Water'?

In *Hell and High Water* Alastair McIntosh described the harrowing process of being asked to write a book that spoke truths about climate change and the human condition challenging even to the green movement. ECOS asked him to reflect on where he currently sees the cutting edges of the debate.

ALASTAIR McINTOSH

Science – rigorous or adventurous?

In summer 2008 my book *Hell and High Water: Climate Change, Hope and the Human Condition* was published by Birlinn. Now into its second edition, here is a personal take on how I see the debate moving.



First some background on the book. Part One is a run-of-the-mill perspective on climate science with illustrative anecdotes and a chapter that assesses the democratic latitude for radical political action. The science I use is the mainstream consensus where, “if it ain’t peer reviewed, it ain’t science.” I take as my baseline the evaluations of bodies that have a reputation worth losing such as the IPCC, the Royal Society and the Met Office. I acknowledge but generally keep some distance from the climate change sceptics on the one hand, and those with a radical scientific position such as James Lovelock and James Hansen (director of Nasa’s Goddard Institute for Space Studies) on the other. Although I have a first degree in earth sciences I am not a climate change scientist. My main interest is to take the consensus view on climate change and employ it as a springboard to much deeper questions about the human condition, as developed in Part 2 of the book.

Having said that, it is difficult to give a public lecture on climate change without being pushed to give a view on perspectives that deviate from mainstream science – the position of climate change ‘sceptics’, ‘contrarians’ or ‘denialists’. My first response is to say that I hope they might be right! Beyond that, I’m just not able to debate in depth because, as a generalist human ecologist, I just don’t understand the arguments on either side deeply enough. Often I’ll listen to a contrarian

argument and find it very persuasive. But when I listen to an informed counter-perspective the glamour falls away. I have observed that much contrarian science, even when based on reputedly peer-reviewed work, stands on a narrow evidential base. But we need to remind ourselves that in science, as we know from biology, one swallow doesn’t make a summer. Solid science must be built on findings that triangulate and replicate.

For these reasons I find myself weighing up the credibility of published authorities as much as the ostensible logic of their arguments. I therefore try and avoid basing my work on expertise that’s outside my bounds of ability to appraise. For example, when challenged from the floor during a public lecture with the theory that global warming is caused not by carbon dioxide but by solar activity, I usually don’t try to tackle the objection head on. Instead, I defer to a higher court, such as the UK Met Office’s recent climate change factsheet. This refers to Myth No. 1 of climate change as being the “purely speculative and unquantified” notion that “the intensity of cosmic rays changes climate”.¹ If the Met Office boffins are happy to sit with that on their web site, then who am I, and usually my interrogator too, to argue otherwise?

The weakness of this approach is that can appear to be an evasion of doing my own scientific thinking. That must be infuriating to my critics, even though I’m not doing it to wind them up. But the strength of such prudence is that it gives a springboard for deeper argument; if I might mix my metaphor perhaps all too fittingly, a *solid springboard* from which to address hope and the human condition in Part 2. The result is that a number of reviewers (including climate change scientists) have praised *Hell and High Water* (HHW) for its grasp and communication of the science. BBC Radio 4’s *Open Book* called it “very scientifically rigorous.” That’s what I wanted: rigorous, but not adventurous in its presentation on which to base the psychological and spiritual issues that I wanted to tackle in Part 2.

Climate change and credit crunch

In bringing out the second edition of HHW the only material change was to add a postscript on the “credit crunch” pointing out that it had the same leading-edge driver as climate change – namely, consumerism. But I also took the opportunity to draw readers’ attention to the communiqué from some 2,500 scientists of the International Alliance of Research Universities who had met in March 2009 to prepare for the UN’s Climate Change Conference in Copenhagen in December. This said: “Recent observations confirm that, given high rates of observed emissions, the worst-case IPCC scenario trajectories (or even worse) are being realised”.²

In Part 2 of HHW I had derived a qualitative equation: *Hubris = pride ? violence ? ecocide*

I presented evidence from history, philosophy, literature, folklore and theology suggestive that this had started at least with early urban civilisation and has progressively damaged both the outer life of the world and the inner life of the

soul. We are left with hollowed-out emptiness – even deeper than that of Freud's "civilisation and its discontents". My study of 20th century marketing in particular in Part 2 leads me to conclude that the human psyche – the totality of body, mind and soul – became wide open to the blandishments of consumerism. Violence to a person's primal integrity – whether specific or systemic within their culture – makes for insecure people, and insecure people make "good" consumers. Because consumerism is a false satisfier – just another form of addiction that masks the emptiness – it keeps most of us on the economic treadmill, pressed on by the usurious dynamics of debt, but ever-failing to tackle the underlying human condition and thereby compounding ecocide.

This analysis led Rowan Williams, the Archbishop of Canterbury, to make extensive reference to *HHW* in his position statement on climate change and ecocide delivered in Southwark Cathedral on 13 October 2009. As the religious correspondent of *The Guardian* summarised:

"People should use the climate change crisis as an opportunity to become human again, setting aside the addictive and self-destructive behaviour that has damaged their souls, the Archbishop of Canterbury said yesterday".³

It is an eclecticism similar to this – from science to the soul – that makes *HHW* what a *Times* columnist called "a fantastically unlikely combination of insights". To *The Scotsman* it "takes a step back from the problem and looks at the causes behind the causes [in ways that are] of genuine international importance." *The Sunday Herald* concluded "It's odd that a book of such bright hope should be based on such practical despondency".

Such weaving of the physics with metaphysics in the crucible of transforming consciousness has not been welcome in all quarters. I have felt stiffness and even overt hostility from some environmentalists, including friends, who, I sense, resent the suggestion that politics, economics and technology alone will not be enough to confront the problems, and who find talk of the soul to be out of synch with secular humanism. For example, an Amazon.com reviewer fittingly pseudonymous as "depressed leftist", panned *HHW* as, "An unsatisfying melange of mainstream analysis and pseudo-spiritual tripe [that shows] more faith in 'the soul' than strictly in reason". A blogger, equally fittingly called "Suitably Despairing", missed the point of extended metaphor and surmised: "Disappointing book of the year was *Hell and High Water* by Alastair McIntosh. This ticked all the right boxes for me, detailing climate change ... but then he started talking about faeries". Well, at least it raised my smile!

Confusion of focus

But I don't think it's just my pushing out of the spiritual boat – whether skipped by the faeries or otherwise - that disturbs a few of my readers. It's also the tectonic question – the one that also disturbs me - of whether there actually is a politically and technically achievable way out of the situation we're in.

In London last March just before the G20 protests I gave a talk that ruffled the feathers of some of the audience. I was challenged as to what I thought of the planned G20 demo and I replied, "Well, who are you going to be marching with? Will it be the environmentalists, urging zero or negative growth to save the planet, or will it be the trade unions, urging the stimulation of growth to save jobs?"

Ideally this should be a false dichotomy. Ideally we should all be advancing to a "green new deal" that both saves the Earth and produces material wellbeing. My worry is that the socio-environmental backdrop to the green movement has changed in ways that have confused our focus. We find ourselves straddled between adjectives of the ideals and nouns expressed as some brutal numbers. As the Cambridge physicist Professor David MacKay says in his acclaimed new book:

"I'm concerned about cutting UK emissions of twaddle – twaddle about sustainable energy. Everyone says getting off fossil fuels is important, and we're all encouraged to 'make a difference,' but many of the things that allegedly make a difference don't add up".⁴

The happy-clappy green bubble

Consider, for example, the current proposal to upgrade the railway line between London and Scotland to half the journey time. Superficially it makes for impeccable green logic. Astonishingly, the rail:air market share on this route is 15% to 85%. That means, leaving aside those who travel by road, about six times as many people fly as go by train. A faster line should change that ratio and presumably cut carbon emissions.

However, the Department of Transport has now released findings that the embodied energy required to upgrade the line, including 170 new bridges and 34 miles of tunnels (more than the Channel Tunnel), would take 60 years to repay its own embodied carbon footprint. What's more, the cost, which started off at £12 bn is now widely pitched at £34 bn, and a specialist rail technology website brings it in at £60 bn.⁵ Even if we take the £34 bn figure, that's the same as the annual government cost of running Scotland, or the same as the entire British defence budget for a year – including our nukes and Afghanistan! We're therefore left with the question: how many such 'green' projects could the nation afford? The Severn Barrage loosely at £14 bn and what else? And if we assume that the mainstream climate science is broadly right, what happens when the carbon-saving benefits of such projects simply aren't 'in time' to stop the anticipated 'tipping points' of runaway climate change?

I believe there's a historical problem here in the green mindset. It was one of the hard knocks I confirmed while writing *HHW* and it goes back half a century. As a green movement (if I might generalise about 'us'), we tend to circulate in what I call the 'green bubble'. Faced with the burden of ecological awareness we mutually buoy up optimism. Greens maybe never get much more than 5% of the vote, yet we're often like one of those fringe happy-clappy churches where, 'if only' everyone stopped doing this, and started doing that, we'd all be 'saved'!

What easily slips our notice is that many of our cherished green scenarios took shape in the 1960s. Their roots extend even further: for instance, Frank Fraser Darling published his seminal back-to-the-land stuff actually during WW2. We've thereby been left imprinted by the sustainable green idyll that the American artist, R. Crumb, in one of his cartoon scenarios called 'Ecotopia' www.citykin.com/2009/04/r-crumb-short-history-of-america.html.⁶ We've been enraptured, and rightly so, because it's a beautiful vision. But what's not occurred to us, until now when the world is asking us to stand and deliver on a green new deal that politically stacks up, is that it no longer adds up. It might have done so if our society had chosen those pathways immediately following World War II when frugality (as distinct from destitution) was no stranger to the body politic. But instead we chose Harold Wilson's "white heat of technology" – the scenario that Crumb represents as his high tech energy intensive 'Futurama'.

Now that we're faced with climate change we're trying to reverse engineer our way back to Ecotopia. The debate on wind turbines says it all. What was and is a perfect component of a back to the land solution becomes a recipe for turning the landscapes that we need to feed the soul into whirling industrial monstrosities. It's the scale that's gone wrong, and as a green movement we've only woken up to it after it's split us down the middle, and in my own case, divided me within myself as well. For the mainstream agencies the name of the game is all the "green new deal" understood not in terms of an holistic human ecology, but in terms of sustained growth. For example, UNEP's *Global Green New Deal Policy Brief* of March 2009 explicitly calls for "future sustainability, while stimulating the economy for growth, jobs and tackling poverty".⁷ Talk to the people who write such reports as I do, and they'll tell you they have to work within the politically acceptable ballpark. Also, I suspect, within the ballpark of their own highly-salaried comfort zones.

The happy-clappy wing of the green movement colludes with this "because we must stay optimistic". Thus, for example, my confidence in the scientific peer review process of the esteemed Worldwatch Institute was severely dented by their 2009 *State of the World* report, 'Into a Warming World'. Here a chapter by Betsy Taylor, 'Not Too Late to Act', looks back from 2025 where "we defied the doomsday prophets" by an array of green hopeful fixes. Included is one where "Pedestrians generate electricity just by walking on energy-generating sidewalks, while health clubs produce electricity through treadmills and aerobics classes".⁸

Leaving aside such abject green wackiness that eschews all sense of thermodynamic quantification, my general point is that pathways of possibility have closed and a one-way ratchet has tightened. We've only been able to garner a world of nearly 7 bn people, half of them urban, because carbon-intensive energy drives a high-velocity just-in-time commodity supply system which is predicated on the competitive application of global comparative advantage with alarmingly long chains of seamless supply ... and virtually zilch resilience to systemic shock!

To talk of "*the transition to a zero-carbon economy*" as Taylor and many green hopefuls do, is all very well, and very necessary ... but in my view, utterly



NEIL BENNETT

undoable enough to make a difference unless we are also willing to entertain real hits to our quantitative material standard of living, and learn to substitute qualitatively. As part of the new Green Economy Coalition of international environment, development, labour and business agencies, my question is always, "A green new deal for what?" To sustain current levels of consumerism? At growing levels of population? No can do! Because oil and its associates have become our lifeblood. We can't suddenly expect to run our bodies on one pint of blood instead of eight! We therefore have to factor in not just carbon, but what renders it so intensive.

My critics will say that this ignores substitution by renewables, but I'm impressed by David MacKay's presentation of the physics, and he reckons that renewables,

even in the UK, can only credibly add up to about 15% of *current* energy demand.¹⁰ In my experience most international climate change agency personnel take the view that “we just can’t go there” in terms of the politics of cutting consumerism – for example, banning the advertising of profligate products. I experience such bounding of the debate as a leakage of energy. The optimism it professes actually conceals pessimism because it keeps us in the displacement activity of barking up the wrong tree. It is an evasion of reality, and with it, the need to fundamentally appraise the human condition in order to seek the roots of hope.

Resilience in the 1966 seamen’s strike

If the quantitative scale of carbon-sourced energy demand is one face of our problem, qualitative impacts on socio-ecological cohesion are the other. Here, in the footsteps of such ecologists as C.H. Holling and Allan Savory we must contrast brittleness with resilience and apply it to human ecology. Let me give an example of what was a resilient human ecology turning brittle, so that we might better sense how it might be reversed.

In May 1966 the National Union of Seamen went on strike for six weeks. Harold Wilson was being forced to declare a national state of emergency. Growing up on the Isle of Lewis, 40 miles NW of the UK mainland, we noticed no real hardship. However, I remember, aged 10, going into a half-built house that was being communally built by striking seamen. Over a peat fire a string of fish was being cured. Thinking back, that was the clue. We had resilience by way of local food security.

During the past summer (2009) I proposed this as a thesis project for a Canadian student, Lauren Eden, who was seconded to me from Edinburgh University’s MSc course in Ecological Economics. She was interested in community dynamics such as those the Transition Towns initiative is rightly promoting. I suggested that she went up to Lewis and interviewed people of my age and older. She should compare what happened in 1966 with what happens today when, for just 24 hours or so, the ferry doesn’t sail because of bad weather.

Lauren spoke to 30 key informants including a strike leader, the former Stornoway Provost, the harbour master, fishermen, taxi drivers and shopkeepers. She actually had to jog memories of the strike by showing old newspaper cuttings. Its impact had simply bounced off most people because local food production in the “crofting” subsistence agriculture system was still very much alive. People still had a milking cow, chickens, sheep untethered by legislation, potatoes in the hopper and a boat down on the sea loch that had not yet been industrially fished out. There was also the strong Hebridean ethic of sharing and looking out for one another. She found that the only real shortage had been beer in the pub!

In contrast, when the ferry fails to sail today there’s panic buying within hours in both supermarkets. Also, today’s supermarkets hold only 24 hour’s worth of stock on most lines. Everything’s just-in-time, but the resilience, the ability of the system to respond to knocks, has gone. Today’s system is utterly brittle. And

imagine if, in October 2008, the banks had crashed to the point where lines of credit dried up. Food supply, not just to a remote island but also to our cities, would have seized up like an engine running out of oil. Civil unrest is just two or three days away.¹¹

The ethical watershed

But what can we do about it? A dilemma that I often see for industry, government and NGOs is that most of the differences that we think are important within the green bubble add up to very little. As MacKay says, “Don’t be distracted by the myth that ‘every little helps.’ If everyone does a little, we’ll achieve only a little. We must do a lot. What’s required are big changes in demand and in supply”.¹² And by ‘big’ he means either nuclear, or such solutions as wind farms covering whole countries.

There’s something in this that troubles me greatly, because I can see its truth, but where does it leave the ‘small change’ within most people’s power? I think that we mustn’t enter into the hubris of fooling ourselves, yet small change can still be important, not for its physics, but for its effect on our integrity, our consciousness.

If we want to keep building a movement for change I find it helpful to think which side of the watershed of consciousness we should throw our efforts onto. Like rain falling on a ridge between valleys, we have to decide whether to flow in the direction of life or death along an ‘ethical watershed’. Which way will our stream help the river of society to flow?

We therefore have to let ourselves be disillusioned. But we also have to strengthen our values frameworks so that our consciousness grows and transforms. As we do this we may come to see that climate change is actually the small question. The big question is about the human condition, and how the ‘burden of awareness’ of what is facing us can be transformed into a ‘precious burden’. Because this is about the evolution of conscious life on Earth.

3Cs and an S

I think there are four things we must work on – what my friend the mediator John Sturrock QC helped me to formulate as ‘3Cs and an S’.

- First, *carbon* emissions must be cut by doing all we can to use less coal, gas and oil both by saving and reducing the carbon-intensity of production.
- Second, *consumption* must be scaled back from excess to sufficiency, challenging profligate consumerism.
- Third, *conception*, so that every child that comes into the world is not only wanted for its own sake, but has parents supported to give time and love that far outlasts the fleeting substitute of consumerism.

- And fourth, *spirituality*, because the only hope is to gradually deepen consciousness into what Abraham Maslow called “the further reaches of human nature”.

In simple terms: $E_i = P \times C$

That's to say, *Environmental* impact equals *Population* times *Consumption*. However, since the 1970s many international agencies for development or environment have treated population as taboo. The ground had become captured by the powerful and politically right, with memories of Sanjay Gandhi using the Indian police to carry out compulsory sterilisations on the poor – many of them Muslims. Because population concern was used for victim blaming, it became discredited. Development workers rightly pointed out that tackling the profligacy of the rich makes more difference than trying to restrain the child-bearing of the poor. After all, the diminishing marginal utility of wealth implies that to take one unit of wealth off the rich won't cause much pain, but will generate much 'utility' amongst the poor.

These are good arguments, but they're no longer good enough. The consumer expectations of the poor are also now escalating. It is rich and poor alike (and especially the rich) who need to be encouraged not to have children who are not truly wanted; and to have only children that will be loved in their own primal integrity.

Such a voluntary but culturally supported ethos rests on foundations that are fundamentally anti-authoritarian because fertility falls when women's education and opportunities rise, when there is security in old age, and when there are good health services including family planning. Those services should include the most effective array of 'natural' approaches for couples so motivated. Religion need not be a hurdle. Consider these figures: UN fertility rate projections for 2005-10 range from war-torn patriarchal Afghanistan with 7.07 births per woman, to the modern Muslim nation of Turkey (2.14), Catholic Ireland (1.96), Mongolia (1.87), UK (1.82), China (1.73), Cuba (1.49), Italy (1.38), Russia (1.34), very Catholic Poland (1.23) and Hong Kong (0.97).¹³

And consider those last few numbers. What most cuts future carbon footprints? Buying a Toyota Prius hybrid car, or creating social conditions in which there is opportunity, gender freedom and welfare to encourage small families? It's not that the Prius isn't a great achievement. It's simply that hard technology needs to be complemented by refining our human software, and with it, our sense of whether we should not just fill the Earth, but transgress divine mandate and *overflow* it.

Towards God-given human potential

More than that ... C for 'conception' in 3Cs and an S must be child-centred. It must be about loving our children; all children held in whole communities. This means considering not just whether to conceive children, but more important, *how we all conceive of children*. In *HHW* I devote a lot of space to exploring violence and the damage it does to a child's primal integrity. Healthy children in a healthy world



Very few crofters still grow corn on the Isle of Lewis. But as this scene from Bragar in 2009 shows, practices that could yet strengthen local food security are still hanging on.

Photo: Alastair McIntosh

need to be relatively free of the psychic injury that is 'trauma'. Raise a child in a war zone and you raise a warrior. Raise a child in a trashed planet and you raise landfill.

I am struck by the fact that Hilary Clinton in her speeches repeatedly refers to honouring the “God-given potential”¹⁴ of children – so much so that journalists now use the shorthand, GGP. Whatever our wider take on Hilary, she's right that a child honoured in itself – not indulged, but taught empathy – will be less likely to be self-centred, and more likely to become a centred-self: a future adult better able to resist the blandishments of consumerism, more able to heal the Earth.

Nature – wild and human

Finally, where does that leave us as people who are variously involved in the nitty gritty practicalities of nature conservation?

To face come-what-may in the come-to-pass with dignity, wisdom and love, we must be humble. Assuming that the science is broadly correct, we have only been walking this planet in our evolved state as *Homo Sapiens* (“wise or knowing humankind”) for some 200,000 years. We are planetary infants, and the travail we currently experience, the upset we're currently causing, could be seen (albeit at grave risk to the Mother) as evolutionary birth pangs. Our challenge now is to grow up fast. In this I believe that nature, and not just human culture, is our teacher.¹⁵ For conservation work in the widest sense I think this means:

- **Connect the science of nature** – the properties of matter and of biology - with the full beauty and emotional engagement of human nature. I recommend studying the management of psychological depth in undertaking this.¹⁶
- **Teach children elemental literacy** of fire, air, earth and water including exposure to carefully managed danger. I recommend Roszak's book, *Ecopsychology*, and also Meredith Sabini's remarkable anthology of Jung on nature, *The Earth has a Soul*.
- **Reveal community as soil, soul and society**, and with it deepen the Cycle of Belonging. I explore this in both HHW and, expanded, in Rekindling Community.



- **Teach the value of ecosystem services** such as the replenishment of aquifers, carbon sequestration in bogs, and photosynthesis bubbling oxygen up through a pond to sustain the atmosphere. And teach such science as David Orr suggests, in a spirit of wonder, gratitude, and even reverence.
- **Cherish nature reserves as ecological islands.** Given climate change, work to reconnect them with wildlife corridors. And bugger the excessive health and safety that would have kids putting on rubber gloves to pick things up outdoors!
- **Through the arts and direct encounter, encourage 'animal spirits'** to touch human consciousness perhaps as understood by totemic cultures. And if that's a problem for a certain sort of Christian, invite them to deliver a sermon on the Eagle of St John, or the Lion of St Mark, or chapter 12 of the Book of Job which says, "But ask now the beasts, and they shall teach thee; and the fowls of the air, and they shall tell thee; or speak to the Earth, and it shall teach thee..."

...because this is about the sacred work of our times. And it will only succeed if the science, and the hard work, are grounded in that nothing less than ... [I'm sorry if this seems a bit too full on] ... the muddiness of the pond and the fire of love. For these are the things that give life, and in that I carry little optimism for what often feels like doing planetary hospice work, but constant hope.

References

1. www.metoffice.gov.uk/corporate/pressoffice/myths/index.html, accessed 18 Oct 09.
2. IARU, "International Scientific Congress", www.iaruni.org/events/past/meetings/090310_climatesummit/index/, accessed 18 Oct 09.
3. Riazat Butt, "Climate crisis a chance to become human again, archbishop says," *The Guardian*, 14 October 2009, p. 8, www.guardian.co.uk/uk/2009/oct/13/rowan-williams-climate-crisis; Archbishop's full speech at www.archbishopofcanterbury.org/2565, accessed 3 November 2009.
4. David J.C. MacKay, *Sustainable Energy Without the Hot Air*, UIT, Cambridge, 2009, p. viii.
5. High-Speed Rail Less Green Than UK Air Route, Says Report, www.railway-technology.com/news/news62155.html, accessed 18 Oct 09.
6. R. Crumb's Short History of America, www.citykin.com/2009/04/r-crumbs-short-history-of-america.html, accessed 18 Oct 09.
7. www.unep.ch/etb/publications/Green%20Economy/UNEP%20Policy%20Brief%20Eng.pdf, accessed 3 November 2009, p. 1.
8. Linda Starke (editor), W.W. Norton & Company, NY, 2009, p. 128.
9. See www.iied.org/general/media/green-economy-coalition-urges-g20-match-rhetoric-action.
10. MacKay, *Sustainable Energy* ..., p. 109.
11. See Carolyn Steele, *Hungry City: How Food Shapes our Lives*, Vintage, 2009.
12. MacKay, *Sustainable Energy* ..., p. 114.
13. Table A.15, UN World Population Prospects: the 2006 Revision, www.un.org/esa/population/publications/wpp2006/WPP2006_Highlights_rev.pdf, accessed 19 Oct 09.
14. BBC: Clinton focuses on soft power, <http://news.bbc.co.uk/1/hi/world/americas/8312913.stm>, accessed 19 Oct 09.
15. Thanks to Rob Bushby of the John Muir Trust for discussion on this – see www.jmt.org/2050.asp.
16. Martin Ringer and Lee Gillis, "Managing Psychological Depth in Adventure Programming," *J. Experiential Education*, 18:1, 1995, <http://leegillis.com/AT/PDF/psychdepth.pdf>.

Alastair McIntosh is a Fellow of the Centre for Human Ecology and Visiting Professor of Human Ecology at the Department of Geography & Sociology, University of Strathclyde. mail@alastairmcintosh.com

Rewilding the political landscape

Rewilding has been branded a political gimmick by some. In fact it represents a grass-roots shift in thinking towards creative landscape-scale conservation with multiple benefits.

PETER TAYLOR

Whilst rewilding has seemed too daring for some NGOs and agencies to embrace, politicians have not been so cautious. David Milliband flagged it first in a speech when he was environment secretary, and Hilary Benn, his successor, endorsed the concept as a new way forward in conservation at Labour's 2009 party conference (Jonathan Leake, *Sunday Times*, 27 September 2009). Some journalists dismiss the notion as a political gimmick demonstrating a lack of appreciation of the real issues in the countryside (Terence Blacker, *The Independent*, 30 September).

Over the past five years, the Wildland Network has initiated a series of regional seminars and exchanges to promote the initiatives of the National Trust (e.g. at Ennerdale¹ and Wicken Fen²), the Forestry Commission (Ennerdale and Glen Affric), the Woodland Trust, RSPB, the Wildlife Trusts and the public subscription projects of Trees for Life³ and Carrifran^{4,5} as well as individual landowning developments in Alladale^{6,7} and at Knepp Castle Estate.⁸ Additionally the Network has focussed attention upon the restoration of key species, such as wild grazers and their predators.^{9,10,11,12,13} Thus the 'rewilding' wave is not a new political gimmick but a response by government to this new wave. A Wildland Research Institute has been launched at Leeds University and there are ongoing studies at Aberdeen University on the potential for wolf re-introduction in Scotland. (wolvesandhumans.org and see also Paul Eccleston, *Daily Telegraph*, 29 November).

In the agricultural wilderness

In eastern Britain, fenland and coastal marsh restoration projects co-exist with high production wildlife-free zones, creating a potential mosaic. The recent recolonisation of the region by the common crane, a large bird that requires disturbance-free nesting zones more readily associated with Scandinavia and Eastern Europe, is an indication of major progress toward wilder land.

The trends toward intensive agricultural production and the concomitant loss of wildlife on both arable and pasture land can be partly addressed by smaller scale mosaic approaches that make use of wild headland, margins, coastal strips, streamside and corridors, using extensive grazing by special breeds and targeted subsidy. In this strategy, even the wildlife-deserts of the grain-belt can be improved without significant loss of production, employment and changes in rural life. No one is advocating wolves in East Anglia, Dartmoor or Exmoor, but with the Forestry Commission now officially admitting they have feral panthers in the

Forest of Dean,^{14,15} and lynx being regularly sighted across Britain, including in the Mendips¹⁶, there must be a case for official return of Eurasian lynx, especially in regions afflicted by an over-abundance of roe and muntjac.¹⁷

Progress in this area would be made much easier if land-owners could get payments for any acreage taken out of production and given over to this kind of 'neural network' of connectivity.^{18,19} Where such networks acted as corridors between core reserves, the latter might contain wild grazers such as free-ranging cattle, deer, ponies and boar.²⁰ We would encounter issues of road-safety, disease control, pedestrian safety and public rights of way²¹, as well as crop damage and given the over-developed Health & Safety culture, prospects are perhaps not so good, but then rewilding also has to be extended to the human psyche.²² In Romania in the mixed landscape of the Carpathians, I was struck by the absence of fences and warning signs – even in the towns where road-works presented dangerous holes to the unwary – the whole culture was wilder in the sense of not so incredibly uptight about risks. If you have bears in the woods, the best protection comes from a cultural knowledge (and acceptance) of the risks, not fences with warning signs to the uninitiated.

But again, in the English *farmed* landscape, wolves and bears are not a prospect, and though lynx might be, the main concern is with bird species, flowers, insects, rodents, amphibians and reptiles. The sea eagle in East Anglia might pose more of a challenge given its (undeserved) reputation for taking lambs – but this is (again) more of an issue of education and responsible media-coverage.

These issues are topical. A recent seminar by the British Ecological Society and Flora Locale tackled the theme: would it be better to have separate land for wildlife, or have more wildlife-friendly farming methods? The event took a closer look at the prospects for rewilding agriculture but positing the false dichotomy of reform versus separation. An eclectic mix of speakers attempted to come to some conclusion. It was clear to me that farmers, an example being Robert Sutcliffe near Winchester, who leave large field margins, cut hedges at the right time, eschew silage for hay and who farm for quality – whilst also supplying TESCO, can achieve a great balance. His operations are clearly economic yet he maintains the biodiversity of farmland typical of three decades ago. He works with satellite-based precision drilling and fertiliser techniques and has reduced nitrogen dressing fourfold.

Tim Benton, presented the million Euro results of his models at Leeds University showing that organic production would not necessarily benefit wildlife – contrary to every expectation drawn from previous studies, and this encapsulates the problem. Defra and the EU fritter ever more funds away on computerised assessments (with dubious methodology) at academic institutions, rather than the footwork of networking best-practice followed by communication at a grass-roots level. What is clearly required is a cultural shift – and neither they nor the academics are capable of leading such or nurturing it.

Equally, a cultural shift in diet and purchasing habits would cause huge differences to the analysis of conflicting land-use for food and biofuels. With world



The Avalon Marshes project has created extensive reedbeds that have been colonised by otters, bittern and marsh harrier. In 2009 the marshes attracted long-staying great white egret, cattle egret and little bittern.

Photo: Peter Taylor

population set to add another billion mouths to the nearly seven billion of today within the next 10 or 15 years, and the EU pressing biofuel targets upon the same cultivation area, the prospects for wildlife on farms and even marginal land, do not look good. However, the degree of intensification required also depends upon the market for meat products – which consumes seven times the land directly needed for vegetable protein. Simon Fairlie presented some intriguing, if rough, calculations on organic/chemical and meat/vegetarian/vegan alternatives. As livestock pastures are lost to arable there are gains for woodland and hence the potential for wildland. Patrick Whitefield showed how highly productive permaculture units as small-holdings could repopulate the land and also create small-scale havens for wildlife.

Climate-change reared its all-pervasive head, with Defra concerned for food security as well as low-carbon farming and ecosystem services such as carbon sequestration and flood alleviation, but there was no detailed assessment of how biofuel or woodchip targets would be met and what impacts are expected – largely because the targets have been set without any such assessment. Agriculture in general aims to reduce its carbon footprint by 30% by 2020, but apart from the advantages of restoring soil carbon and organic/permaculture systems that have less reliance of fossil fuels, mainstream farming is fossil-fuel intensive though mechanisation, fertilisers and pesticides and it is hard to see how production can be maintained as systems revert to less intensive energy use.

The question uppermost in my mind remained unresolved: is it better to separate wildland (and biodiversity issues) from agricultural land – including within the same farm? This boils down to answering how effective have agri-

environment schemes been at halting the loss of biodiversity, and from the limited analyses on offer, I could not discern an answer. The higher-level schemes of subsidy are voluntary and still a small proportion of farming operations, whereas the more pervasive entry-level schemes offer little that is convincing. Nothing at this meeting convinced me that separation was not the best way forward – and that this would work either as part of the farm's own zoning, or as a targeted purchase strategy on the part of wildlife groups.

Rewilding and conservation: are they at loggerheads?

In my own neck of the woods in the South West there is a good example of the opportunities for wildlife groups to purchase strategic agricultural land. On the Somerset Levels just west of Glastonbury lies the Avalon Marshes project. In this area of flooded peat workings, the RSPB, Natural England and the Somerset Wildlife Trust own several contiguous patches of land covering several thousand acres. The project has created a nationally significant amount of reed-bed interspersed with open pools, alder woodland and adjacent wet pasture with ditch boundaries. Recently the Hawk and Owl Trust purchased over 100 acres of former arable land adjacent to the National Nature Reserve at Shapwick toward the western end of the marshes.

Is conservation wild enough?

This purchase well illustrates the forces at work that counter wildland initiatives. First, several kilometres of new barbed wire fences were erected and the culverts repaired. A small car-park was created, with new gates and information boards. The arable land was to be grazed by sheep and cattle – domestic, of course. On my last walk down the long and now wired-in drove I was led right up to an ancient oak with a large gabled box conspicuously hammered to the trunk. It sported a neat little perch. All that was missing was a sign saying 'Owl's House'.

The Levels are nationally important for their Barn Owl populations, hence the interest of the Hawk and Owl trust in buying land, with the aid of numerous charitable foundations. A good proportion of the population is maintained by such nest-boxes. I was interested, therefore, to attend a talk given by the naturalist Chris Sperring, conservation officer for the Trust, entitled 'Is conservation wild enough?' In his soul, Sperring clearly didn't think so, but he outlined the advantages of HLS payments per acre of land as long as it was grazed in an environmentally friendly way. The Trust gets an income stream. He felt that this also made scientific sense in that nutrient rich arable land would gradually be depleted and returned to herb-rich pasture. Currently, there are no specific schemes whereby land such as this could be turned over to non-agricultural use or wild-grazers. It would require NE to bend the rules – which we know it sometimes can, but more, for landowners like the Trust to know what is feasible. For example, Charlie Burrell managed to do a great deal on 3000 acres of the Knepp Estate in Sussex with English Longhorns, Exmoor ponies and Tamworth pigs.

How far could we go in an environment such as the Levels? Or elsewhere in England such as in the Great Fen project. How far is the Knepp estate a useful pilot? What projects might succeed on Dartmoor, Exmoor or the North Pennines, with greater potential for landscape-scale projects? And in Wales, in the Cambrians or Snowdonia? Or in Scotland – with much larger contiguous land-holdings in Glen Affric, Alladale and the Cairngorms, where there are some very significant private sector initiatives.²³

Wildland values extend beyond biodiversity

The pitfalls of biodiversity indices and targets have been well rehearsed in *ECOS*. Yet, in many discussions I witness there is little appreciation of the limited meaning of the numbers and the operation of species and specialist bias. Thus, the same old arguments resurface about rewilding compromising biodiversity targets. The theme lay unacknowledged in Tim Benton's study which compared organic farms with the same land category, region and farming mix as non-organic – which was probably scientifically accurate, but if the starting base is in the middle of an East Anglian prairie then a farm with lower inputs into such an artificial and wildlife-poor environment could well register less biodiversity. The study aimed at correcting a bias created by most organic farms being in the west and most conventional equivalents being in the east of the country – all very academic, but of little help in deciding whether an organic policy would have overall benefits for biodiversity.

The key issue so often not addressed by groups focussing upon biodiversity and established 'conservation' concerns, is that defining wildlife is a cultural issue as much as a scientific one, and even the science contains often unacknowledged cultural bias. The value of wilder cultural landscapes (as in Ennerdale), rural crafts, traditional farming and forestry, eco-tourism and the health and educational benefits that accrue to people's welfare are as important as the conservation of individual species or habitats. At the other end of the spectrum, there are large holdings of 'wildland' with very little of the original flora and fauna remaining, yet they have strong appeal in the absence of obvious human artefacts – as the John Muir Trust demonstrates. These large wilderness areas are candidates for interventionist rewilding with the return of seed-trees and eradicated species – as in the Trees for Life vision for Glen Affric.

Other large area initiatives demonstrate techniques of wildlife-friendly land use more appropriate to buffer zones and corridors: for example the extensive farming and forestry in Ennerdale, where stands of exotic conifers have been removed and fell-sheep replaced with cattle breeds capable of roaming both forest and moor. This joint National Trust and Forestry Commission plan does not have a fixed end-point. It starts from where the land and the people are now and moves at the community's pace in a generally wilder direction, but it is adjacent to other FC and NT holdings and the prospects are there for a very wild core area to be developed if funds could be made available for a transition from traditional practices to wild grazers and perhaps even the lynx as predator.



Carr development on old peat working in the Somerset Levels – alder, birch and oak with tussock grass and ferns.

Photo: Peter Taylor

There is a recurrent theme in discussions on these potential core areas – a tendency to think *either/or* as if any new idea or pilot implies a complete rethink (and funding scheme) across all sites. It doesn't of course. There is a great deal of sense in targeted grant schemes available for selected areas, such that they do not compromise or interfere with other areas where practices might have other objectives – for example, in the maintenance of heathland by domestic grazing.

Rewilding conservation

So, what are the prospects for a rewilded conservation sector being given a better political environment? People are more questioning of scientific authority when they see it led so often by corporate goals and managerial convenience coupled to specialist interests they cannot comprehend. There is greater popular defence of the grey squirrel than would have been anticipated, as also with Sika deer and other aliens that are well suited to cultural landscapes. As conservation groups have reached out and won broader public subscription they are, perhaps, having to take on public rather than specialist values. This can be a double-edged sword, however, and as with the eradication schemes for hedgehogs in the Hebrides, the balance can be awkwardly tipped by lack of ecological understanding.

The problem with conservation is not just a matter of getting the right subsidy regime – it lies with the mentality of management, goals, corporate structures, econometric minds and the whole language of ecosystem services and the 'customer' paradigm that goes with these times. Bill Adams²³ picked up on this in last edition of *ECOS* and it is heartening to see academia taking a stand, but the conservation sector is now big business, accounting for £500m of expenditure in the countryside (about five times the whole upland subsidy for Wales), and whilst that presents a tremendous opportunity, it also constitutes a major constraint. If

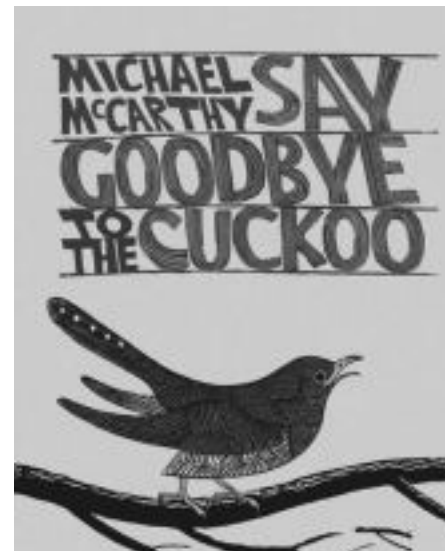
we are going to move beyond the pilot projects we have monitored for the past 10 years, conservationists are going to have to go wild themselves! Someone has to start taking risks, and pursue the prompts from Labour Environment Ministers.

References

1. G. Browning & R. Yanik (2004) Wild Ennerdale – letting nature loose *ECOS* 25 (3/4) 34-38
2. A. Colston (2004) Wicken Fen – realising the vision *ECOS* 25 (3/4) 42-45
3. A. Watson Featherstone (2004) Rewilding in the north-central Highlands – an update *ECOS* 25 (3/4) 4-10
4. P. Ashmole & H. Chalmers (2004) The Carrifran Wildwood Project *ECOS* 25 (3/4) 11-19
5. H. Chalmers (2007) Ecological restoration without all the pieces – early news from Carrifran *ECOS* 28 (3/4) 89-95
6. R. Sidaway (2006) Alladale's fenced wilderness – making a breakthrough? *ECOS* 27 (3/4) 30-35
7. P. Taylor (2008) Alladale's wilderness – seeing through the fence. *ECOS* 29 (3/4) 18-24
8. P. Taylor (2006) Home counties wildland: the new nature at Knepp. *ECOS* 27 (3/4) 44-51
9. N. Harris (2006) Ecosystem effects of wild herbivores – lessons from Holland *ECOS* 27 (3/4) 58-60
10. P. Hadfield (2009) Too M Oates (2006) Grazing systems and animal welfare – matters of life and death *ECOS* 27 (3/4) 52-57
11. D. Blake (2007) Deer in Britain: the challenges for nature conservation *ECOS* 28 (2) 41-49
12. P. Hadfield (2009) Too hard to bear? People and large carnivores in Slovakia *ECOS* 30 (2) 76-84
13. D. Hetherington (2006) The Lynx in Britain's past, present and future *ECOS* 27 (1) 66-74.
14. J. McGowan (2007) Big cats in Dorset: the evidence and the implications *ECOS* 28 (1) 73-78
15. P. Taylor (2002) Big cats in Britain: restoration ecology or imaginations run wild? *ECOS* 23 (3/4) 30-64
16. Moiser C. (2002) On the prowl, Lynx in the British Countryside, *ECOS* 23 (2) 9-13
17. D. Hetherington (2009) The history of the Eurasian lynx in Britain and the potential for its re-introduction. *British Wildlife* 20: 77-86
18. A. Parfitt (2006) New nature in Holland – attitudes and achievements *ECOS* 27 (3/4) 65-69
19. S. Carver (2006) Connectivity of nature in the Dutch landscape *ECOS* 27 (3/4) 61-64
20. N. Harris (2006) Ecosystem effects of wild herbivores – lessons from Holland *ECOS* 27 (3/4) 58-60
21. M Oates (2006) Grazing systems and animal welfare – matters of life and death *ECOS* 27 (3/4) 52-57
22. P. Taylor (2005) *Beyond Conservation*. Earthscan.
23. Adams, B (2009) Conservation and consumption. *ECOS* 30(2) 2-10

Peter Taylor directs *Ethos* UK. ethos_uk@onetel.com

Book Reviews



SAY GOODBYE TO THE CUCKOO

Michael McCarthy

John Murray (Publishers), 2009, 243 pages
Hbk, £16.99, ISBN 978-1-84854-063-7

As a journalist Michael McCarthy has been assiduous in discussing the fortunes of nature conservation in a way which treats the issue and the reader seriously, but with an engaging storyline. He takes the same approach in this book – a journalistic account of the decline of our summer migrant birds. He wants to find out for himself (and for his son who accompanies him on his quest) why these birds, his so-called “spring-bringers”, seem to be slowly disappearing from our countryside, parks and gardens.

The gradual attrition of our scrub-flitting and dawn-calling summer

migrants (how many cuckoos did you hear last spring?) has been well-documented in recent years, and those of us who venture outside with swivelling eyes and well-attuned ears have the evidence provided by our senses to attest to this sad decline. But the evidence that is presented in conservation documentation and ‘State of ...’ reports is dulled and stultified by describing this tragedy via the medium of traffic-light colour-coding and declines measured by percentage points, so I wonder how many of our fellow-travellers, from ardent ‘climate-camp’ campaigners, to the well-meaning, robin-bothering RSPB member (me included!) are really aware that we are being robbed of our spring and summer?

Mike McCarthy, a passionate advocate (albeit by his own admission no expert) is himself surprised by the impact of the potential catastrophe that is coming. He describes the spring migration as “a great aerial river” that is now in danger of drying up. He surmises that the failure of the British public to react to this is the result of a latent folk memory that we collectively hold about the richness and diversity of the British countryside. We have all heard nightingales and cuckoos haven’t we? (Or believe we have because the populist reinterpretations of the verse of the romantic poets and the text of Victorian novelists, and the comforting charm of the Archers, tell us so). Indeed, McCarthy demonstrates that our summer migrants are now more likely to be encountered second-hand rather than in the bush, as each chapter combines an exploration of the bird’s presence in art, literature and folklore with a real journey of discovery to find the birds themselves.

McCarthy is genuinely thrilled that you can still get the real experience, with a little bit of effort and help from friends and dedicated nature-lovers; and he is bothered that his son might not be able to take his children on a similar journey of delightful discovery.

This book helps the reader reconnect with those special birds of spring and summer, but it is not simply an evocation of those bright and vibrant months of the year – a read that will keep our spirits high through the dark, cold winter months. By reconnecting us to the spring-bringers the stories remind us of our connections to the wider world and prompts us to consider not only how to conserve the dwindling habitats in our own countryside but the importance of an international effort to maintain habitats for both birds and humans across the globe. (Whitethroats, reed warblers et al are not the only West African migrants that face perilous journeys to Europe's northern lands).

The trouble with so much of the nature conservation canon is that they are books by nature conservationists for nature conservationists, or are reveries or musings that require the reader to be already "on-side" to some degree. This book is different. It, I think, speaks to a broader audience; not just the nature conservation community but to a broader coalition of people who might be willing to question the way we understand the world around us.

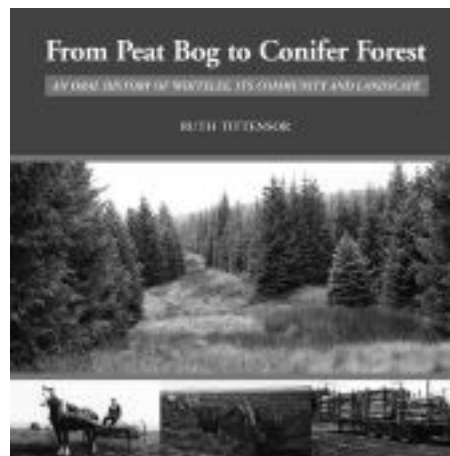
McCarthy quotes Ted Hughes 'Swifts' at the beginning of the book:

*"They've made it again
Which means the world's still working."*

If our nature conservation message is to sound more strong and embed itself

as a core value of a civilised society we need far more people to understand this sentiment.

Peter Massini



FROM PEAT BOG TO CONIFER FOREST An oral history of Whitelee, its community and landscape

Ruth Tittensor,
Packard Publishing, 2009, 237 pages
Pbk, £25.99 ISBN 978 85341 142 7

Afforestation has produced arguably the biggest changes in land use and landscape in the uplands of Britain since the Highland Clearances. Now, for the first time that I am aware of, the story has been told in the words of local people. We are used to hearing the compartmentalised views of technical specialists but not to getting the overview that can be provided by local people who have lived through that process of change. Ruth Tittensor has produced a remarkable oral history of the 6000 hectares that were planted with Sitka spruce between 1961 and 1992 on the Whitelee plateau 20 km south of Glasgow. As Christopher Smout

indicates in his foreword, she ably demonstrates the value of listening to the community. This work of scholarship is meticulously researched and beautifully illustrated with photographs taken by both Ruth and her husband Andrew Tittensor. They tap into the collective memory of an isolated area, which "never belonged anywhere". Indeed if you want to find it on the map, it sits on the margins of three different 1:50,000 Ordnance Survey maps.

The story starts with recollections of those who lived close by and worked on the moorlands: cutting peat for fuel, farming, egg collecting, and numerous other ways of harvesting the sparse resources of these hills. Many people moved away as they sold land to the Forestry Commission. We hear the stories of the men who laboured to plough, drain and plant the land, their hardships and eventual sense of achievement; of walking or using a pushbike to get to work; of working from 7am to 6pm in the wet and cold, pestered by midges; and of their resolution in rescuing machinery swallowed by the bottomless peat hags. We share their final sense of achievement: "It's good to know I was in at the instigation of that". Yet all this endeavour produced limited economic benefits to the local population. The establishment of the plantations provided temporary employment, much of it for 'outsiders' and increasingly timber harvesting is mechanised. Harvesters fell and trim, and forwarders extract the trees that formerly would have been handled by 30 fellers with chain saws.

The changes to wildlife are also set out in detail. As the landscape changed, so did the bird and mammal populations. But local people showed more concern about the loss of familiar

birds (grouse, blackcock, snow buntings, skylarks) than pleasure at the arrival of new species (roe deer, siskins, foxes and grey squirrels) and this says as much about our attitudes to change than our views on biodiversity. For them, active peat bogs were 'hooching with life'. But for almost half a century, this plant life has not been nibbled by sheep and cattle to the benefit of grasses, mosses, lichens and liverworts. These may not be iconic species but the detailed section on lichens is fascinating. We learn that the longer the habitat, such as a stone wall, is undisturbed, the greater the diversity of species of lichens and the greater the number of rarities can be found there.

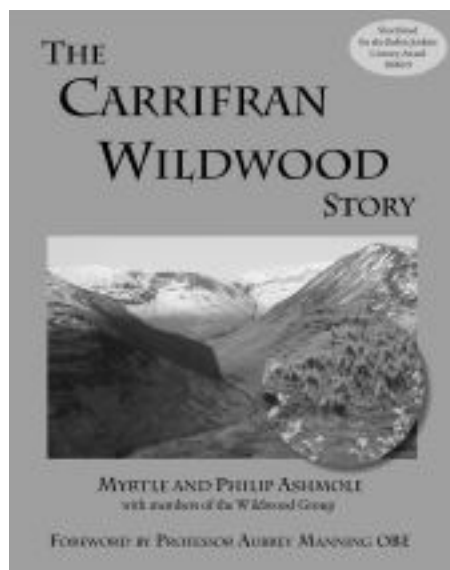
One of the many strengths of this book is the account of the changing social structure of this isolated area. The network of owners, farmers and local people are replaced by an increasingly distant institutional owner which loses contact with the community as numbers of local staff are reduced. "The only activity we see is when they come and cut the grass around the sign saying Whitelee Forest." The Forest's distance from successive administrative centres and from other big forest blocks produced isolating effects as well as feelings of being forgotten. The later chapters point out the fallacy of economies of scale when applied to a marginal area. Rather than rely on local knowledge and the contacts of locally based staff, specialist foresters now cover vast areas of Southern Scotland. As the Commission's mission changes and ideas of a strategic timber resource fade, Whitelee is placed on and then removed from the 'disposals list'. The forest has been transformed in parts by the erection of wind turbines which could become a 'farm' of over 200 turbines. These farm roads may give greater public access but

the forest inhabitants have to adapt to noise, flickering and lightning strikes.

The closing chapters cover the issues that are important to local people and highlight their attachment to the land. Whitelee has survived many vicissitudes of biological, economic and social change. Areas like Whitelee may seem 'marginal' to the professionals but not to those with a deep attachment to the land such as farmers, foresters and biologists. Their vivid account of change at Whitelee is complemented by many knowledgeable local specialists, such as the lichenologist, and land managers would do well to tap into their expertise.

But what is particularly revealing is the value of indigenous knowledge. Ruth Tittensor makes a compelling case for using oral history and tapping into local knowledge to understand a place in its full sense, instead of relying solely on 'experts'.

Roger Sidaway



THE CARRIFRAN WILDWOOD STORY

Myrtle and Philip Ashmole with members of the Wildwood Group Borders Forest Trust
This book is only available direct from BFT, to ensure that all profit goes to the project. Buy online at www.bordersforesttrust.org or phone 01835 830750. £20 inc p&p.

On 1 January 2000 the first trees were planted to begin restoration of the Wildwood in Carrifran, in the southern uplands of Scotland. This book has been written to celebrate the first 10 years of this wildwood, and to tell the story of how it has come into being. The main aim of the project was the ecological restoration of this piece of upland Britain, but the Wildwood Group who steered the project also wanted it to be an inspiration and a model for other projects. The book plays a central role in this aim by recording the process and showing how a brilliant idea has become reality.

The book is well written, the text is concise and highly readable. Even the long chapter with the geographical and biological information avoids becoming a dry list and maintains a story-telling style while providing detailed information. Almost every page has a photo, complementing the text and bringing the place, the people and the project to life.

The chapters follow a logical sequence, starting with the idea of ecological restoration, and the inspiration behind the project. There follows an account of the formation of the Wildwood Group, the search for a site, and raising the money for the purchase. Two chapters provide a

detailed description of the valley and the surrounding area, including history, geology and plant and animal species. The remaining chapters describe the work and the resulting changes. The discovery of a pre-historic archer's bow in peat above the valley provides a powerful cultural connection to the area which is the reference for the ecological restoration.

What has struck me in following this story is how a dynamic group of people were drawn together at the earliest stage, and this has allowed the Carrifran project to gather its own momentum. A huge amount of voluntary work has been required, but there is no sense of any individuals taking the credit. There is instead a recognition of the input of all the volunteers, donors and staff, and a sense that people were inspired to give in many different ways.

The endeavour to make the planning inclusive seems to have been challenging. To quote Willie McGhee in the book, "...patience is vital to establishing an understanding within a sea of disparate voices..." But he also goes on to say "...the democratic process involved in formulating management principles for an ideologically inspired project can be deeply rewarding...". The fact that people have strong opinions on the subject of land management demonstrates the sense of ownership that people have for the land.

This co-operative style has also been used in writing the book, with some sections and chapters written by different contributors. And yes, it does work as a manual on 'how to restore a wildwood'. I have already found it

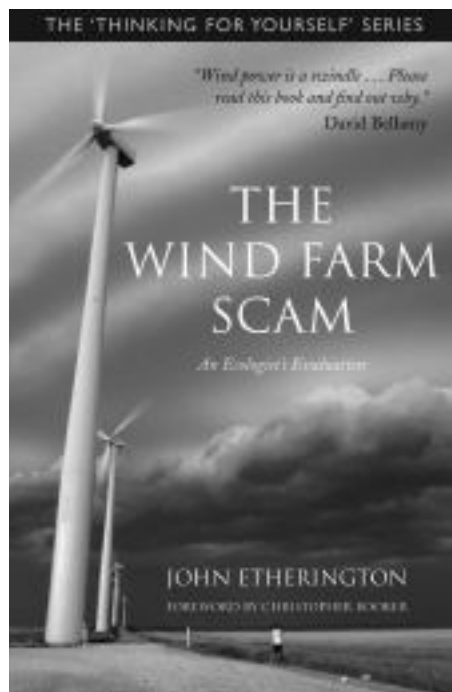
useful in approaching a similar project being established in the Cambrian Mountains, and we will certainly borrow some of the ideas that have contributed to the success of Carrifran.

The project is one of a few examples in Britain of large-scale ecological restoration, sometimes referred to as 're-wilding'. There is some debate about the extent to which wildland should be managed. The approach at Carrifran will be to let natural processes take over in the long term, but to initiate the process by establishing a restored ecosystem through tree planting. The detail of the restoration was well-researched, in terms of species and structure of the new wildwood. It will be centuries before the restoration can be considered complete, with a diversity of ages and a complement of ancient trees. By then we can hope that all the native fauna will have returned to the area.

This approach contrasts with the Wild Ennerdale project where manipulation of the habitats has been kept to a minimum: spruce stands have been retained and grazing continued. The different approaches perhaps reflect different philosophies. In neither case is a definitive end point being sought: nature will decide how the site develops. However, in one case an end point is implied by the initial restoration choices. In the other, the choice is to minimise human influence from the given starting point. There is no wrong or right answer here, and it is fascinating to see the diversity of approaches across several re-wilding projects. Obviously, decisions to not remove spruce or not to plant native woodland are management choices in themselves. It can be a long-term

process for nature to restore its balance. If it is clear that the balance includes more native woodland, then it is ecologically sound to help that process by planting, and welcome if we can all enjoy the outcomes sooner.

Stanley Owen



THE WIND FARM SCAM An Ecologist's Evaluation

John Etherington

Stacey International, 2009, 198 pages
Pbk, £9.99 ISBN 9 781905 299836

Having lived with the spectre of more than three dozen proposals for wind 'farms' and experienced four public inquiries over the past nineteen years I have become accustomed to reading information both for and against wind power. Thus I started reading *The Wind*

Farm Scam imagining that it would be a routine clarification of some of the main points. How wrong I was – the book is absorbing. John Etherington's style makes it easy to read and although many of the aspects covered are highly technical they are explained in a manner that enables the layman to grasp the facts that elude many decision makers.

John Etherington is a former editor of the international *Journal of Ecology*, and has been a source of independent expert advice on wind farms over the past decade; despite unpleasant tactics against him from the British Wind Energy Association he has steadfastly and persistently provided technical expertise and responded to UK and Welsh Assembly Government consultations. He begins by describing his background and how he reached the point where he has spent many years "abstractedby the need to expose the *failings of this damaging industry*." This book does just that.

We are guided through the development of wind turbine characteristics and wind requirements, with clear explanations of technical terms. This is put into context by considering the targets set by UK Government. I found the discussion of small scale renewable energy feeding into the National Grid of particular interest as I had not imagined that this would be so difficult, and had thought that it could be an opportunity for local action. It is apparent that nothing's that simple, and it is little more than 'green dressing' and is likely to be yet another reason to increase electricity costs for the majority.

All eleven chapters of the book have been thoroughly researched and clear

evidence is given for every statement and every conclusion. He considers the evidence of noise, reliable electricity generation and subsidies – or whatever term the wind industry prefers to use for those incentives; however, when he explains the Renewable Obligation Certificates and the Climate Change Levy we see that subsidy in excess of £3.5m per installed megawatt is provided.

It has been a constant contention that impacts on landscape and wildlife are glossed over in hundreds of wind developers' Environmental Statements accompanying their plans, and the views that delight you on a journey or standing in a favourite spot have over the years been downgraded by developers as 'flat and featureless'. As a so called 'NIMBY' once said to me, "If I don't look after my back yard, who will?" John Etherington describes: "Every twist and turn of Britain's lanes and byways opens a new and heart-stopping vista. Each hedge and hillside hides changes of geology and geography in a patchwork map of incredible beauty". It would be very hard to accept that the solution to our nation's electricity needs would be found by building thousands of wind turbines throughout Britain, but many people still imagine that this would be a sacrifice worth making. It is unlikely that the 'wind fundamentalists' will read this book. However, for those who have an open mind and who want the facts in a readable fashion, this is it. The thousands of people who study the topic to some extent will return to this book time and again.

John Etherington provides real world evidence, hard figures and facts backed up by clear explanation. "Enthusiasts (and lobbyists enriched by subsidies)

who have rushed into extensive wind farm developments will be seen in due course to have taken public opinion for a colossal ride, although this may take some years to emerge". (Lord David Howell and Dr Carol Nakhle – *Out of the Energy Labyrinth*, 2007). This quotation at the beginning of Chapter 3 hits the nail on the head. The real world evidence demonstrates that wind turbines cannot contribute usefully to our electricity needs, they cannot reduce carbon emissions meaningfully, they are incredibly expensive, and damage landscape, wildlife, and people's lives – so much for sustainability! John Etherington started looking into wind turbines as an interested analyst but the results of his research led to him becoming a campaigner with a generosity and expertise that is valued internationally. The one point with which I take issue is that wind power has no part to play; I would suggest that it does; but only as stand alone, not as part of any grid system; this therefore makes wind power in most parts of most developed countries little more than a very expensive and very visible money-making racket.

Alison Davies is a Principal Consultant for an ethical consultancy based in Wales; she has more than 13 years experience in sustainable development, specialising in rural and community issues. Her husband is a farmer and they have brought up their two sons on their isolated hill farm where they have lived for the past 26 years. The family were offered wind turbines on their land some 17 years ago, but research into the topic led them to refuse that offer and oppose further applications.

MANAGING SCOTLAND'S ENVIRONMENT

Charles Warren

Edinburgh University Press. Second Edition 2009. 490 pages. Pbk, £29.99, ISBN 978-0-7486-2491 1

To my shame, I came to this update of Warren's book without knowledge of the original 2002 edition. First sight of the new weighty book, with its nearly 500 pages and sparingly illustrated monochrome format, engendered some reluctance to embark on writing a review, in a caravan on a wet day looking over the seascapes of the Scottish northwest. Ten minutes, however, were enough to induce a sharp change in attitude. The thoughtful prefatory remarks, helpful 'expanded contents list' with page numbers, clear and well chosen diagrams and a reference list running to more than 50 pages inspired confidence and engaged my interest. Soon it became apparent that Warren had provided a masterly treatment of a vast and important topic.

This is avowedly a textbook and like many good texts it was written because an academic found that no available book met the needs of his students. The production of a fully revised new edition only seven years after the original will allow students and non-students alike to benefit from Warren's measured and up-to-date assessment of a broad array of currently debated issues relating to the Scottish environment. Older readers worried that modern students may be as dependent as most ordinary people on uncritical internet sources of information can be reassured: the comprehensive treatment and access to primary sources provided by a book

of this quality should ensure that 'research' on the issues that it covers avoids both superficiality and blinkered partisanship.

As Warren is keenly aware, Scottish devolution in 1999 coincided with the start of a decade in which environmental issues leapt up the agenda of politicians and percolated the consciousness of ordinary people all over the world. In Scotland, loosening of the grip of Westminster politicians and of traditional party structures as a result of devolution and proportional representation has led to some highly significant environmental initiatives, including those relating to community buyouts and change in the access laws.

Warren makes use of a remarkable range of literature in analysing a series of issues including conservation management and rewilding, land tenure, management of forests and other terrestrial and freshwater resources, agriculture, public access, and recreation. A stimulating and challenging chapter on environmental ethics includes timely reminders that "putting limits on growth was (and remains) politically unacceptable" and that in spite of the current high profile of environmental issues, few people attach a higher priority to environmental quality than to their (short-term) material well being. Politicians in a democracy thus often reasonably conclude that they need pay little attention to nature. For instance, they pay lip-service to sustainable development (the anyhow anthropocentric idea that we can go on 'developing' indefinitely so long as we don't foul things up for our descendants) but typically appear to ignore the Stern Report's conclusion that even in merely economic terms, our best

course is to pay now to mitigate climate change and to adapt to those changes that are already inescapable. Warren quotes depressing conclusions that "although no policy document can now be written without some verbal genuflections to SD [sustainable development], when the levers of power are operated, it is often quietly forgotten".

Warren avoids taking sides on controversial issues, but shows a refreshing readiness to make critical comments, for instance on the lack of "overall strategic locational guidance" (p.351) in relation to the siting of wind turbines, and on "the complexity of the UK's state support systems which has made them effectively inaccessible for local communities" (p.359) in relation to ownership of wind power developments. He also comments on the difficulty of keeping up to date at a time when management of the Scottish environment is moving so fast. The Scotland Rural Development Programme or SRDP is a case in point (in the somewhat idiosyncratic index to Warren's book look also under '*Scottish...*'). If Warren were writing now rather than a year ago, he would have a chance to highlight the notorious complexity of this programme, which is responsible for high levels of stress and loss of morale among staff of the relevant agencies and much frustration among the 'clients'.

In his final chapter Warren generally welcomes the move towards more 'joined-up' rural policies of which SRDP is a manifestation, and outlines the benefits from partnership working. He admits, however, to the challenges raised by inter-agency and partnership working, including the need for multiple skills, the danger of managers drowning in information and the risk of policy seizure.

These dangers are worthy of note since they tend to frustrate the goal of community involvement, which ranks high among government objectives. Obvious results of the increasing bureaucratic load is that the civil service expands, consultants and advisers flourish and – presumably – a smaller percentage of the available funds go into the actual process of environmental improvement.

Nonetheless, at least one recent initiative of the Scottish Government that has developed since Warren finished his book opens exciting new avenues. The Climate Challenge Fund (CCF) has already awarded £12m to help local communities reduce their carbon emissions, and may be able to provide at least as much again over the three years 2008-11. Furthermore, by avoiding excessively rigid interpretation of the core aim and by providing support for community groups, CCF is empowering local people and helping to revitalise grass-roots environmental activism. Such activism, manifested partly in the burgeoning transition movement, may prove crucial on a broader scale in the effort to move towards more sustainable management of the global environment. It may be no accident that such a bold government initiative should have arisen in Scotland, where proportional representation has had the effect of making citizens aware that they can influence central policy as well as getting their own hands dirty, thus enabling them to participate in more than a token manner in management of their own environment.

Perhaps environmental charities should pay for Warren's book to be widely distributed within government and its agencies, and simultaneously mount a concerted campaign for greater

courage and more far-sighted vision, along with simplified procedures for controlling development, increased government support for environmentally beneficial action and further nourishment of the grass roots.

Philip Ashmole

**WHERE THE WILD THINGS WERE
Life, death, and ecological
wreckage in a land of
vanishing predators**

William Stolzenburg
Bloomsbury, 2008, 291 pages
£15.49, Hbk, ISBN 10 1 59691 299 5

We've all seen the nature programmes on TV. They are excellent and I am not one to criticise. Good ones might tell you about an animal, very good programmes will tell you about the habitat in which an animal lives. But there's the rub – a habitat is generally portrayed as something an animal lives in, what we should be seeing is animals as integral parts of their habitat, creating and shaping their world.

Animals often drive the ecology of an ecosystem rather than just live within it. Large herbivores graze areas, creating grasslands; beavers build dams, creating wetlands – so, animals can affect vegetation and alter ecosystems. Stolzenburg, however, goes a step further. He shows, in a clear, entertaining and readable way, how top predators drive the ecology of areas – how big fierce things rule the world. Furthermore, he shows how many ecosystems around the world are in a tail-spin of degradation and collapse because they lack predators.

This is an excellent book. We may know that wolves are back in Yellowstone, USA, but nowhere else

have I read such a clear explanation on how wolves have changed the behaviour of other species and in the process beneficially altered the vegetation. We may have seen cute pictures of sea otters off the Canadian coast but nowhere else have I read such a good description of how they keep the populations of sea urchins down, which would otherwise devastate marine kelp forests.

He introduces us to concepts such as a 'trophic cascade', the idea that if you remove predators then the effects bounce around the ecosystem in unpredictable and destructive ways. For example when wolves were hunted to extinction in Yellowstone then, predictably, deer numbers exploded, vegetation became over-grazed and many plants and animals declined. Less predictably, without wolves, coyote populations increased which hunted Pronghorn Antelopes. When the wolves returned, the coyotes were intimidated, and Pronghorns increased – an interesting insight of how a predator can *increase* the population of a prey species.

Examples pour out of this book developing a powerful argument to show the critical value of predators. From the effect of starfish on mussels to cougars on white-tailed deer, in each case the presence of a predator sends out ripples giving a richer, more diverse, more stable and better functioning ecosystem.

Discussions on what drives the ecology of ecosystems are always fascinating. The world is so diverse that most views are probably right somewhere – often the keystone species will be predators, often large grazers, sometimes ants, fungi, even midges!

Stolzenburg makes an excellent case for predators and he does not shy away from 'political' implications. The deepest resistance to the return of wolves in Yellowstone came from hunters who wanted the maximum number of docile deer that are easy to shoot. Killer whales are now eating otters and seals because we have killed off their main prey – the large whales. This is uncomfortable to both whaling commissions (unhappy that whaling could be damaging ecosystems) and conservationists (who consider over-fishing as the main cause of seal decline).

This book also boosts the case for re-introducing predators. We do have good arguments, but sometimes we give the impression of a top predator just sitting at the top of a food chain gobbling up the surplus. Stolzenburg gives us a deeper ecological argument – whole ecosystems are suffering, in Britain as anywhere, through lack of predators. We need them back for the health of our own environment.

Tony Whitbread

**CONSERVATION REFUGEES
The hundred-year conflict
between global conservation
and native peoples**

Mark Dowie
MIT Press, 2009, 341 pages
Pbk £18.95 ISBN 978-0-262-01261-4

When librarians catalogue *Conservation Refugees* it would be nice to think of them consigning it to the history shelf rather than the environment section. For as the sub-title states, this is a book that traces a hundred years of conflict, which seems to be reaching a crescendo at just the time when the problems the book recalls have a better chance of being solved than ever before.

The book starts with an eloquent portrayal of a Masai spokesman highlighting the injustice of conservation against his people. It is a poignant story which illustrates the central tenant of this book, which charts the history of the 'good guys v the good guys' i.e. indigenous people and conservationists. (I must say this explanation in the first line of the book instantly made this female conservationist a little less sympathetic to the cry for social inclusion that the author espouses).

This is not the first time that the issue of human rights and protected areas has been discussed in recent years, but it remains a problem that needs to be brought to the attention of all those who call themselves conservationists. But as seems to be the trend with much of the literature dealing with this difficult subject, a little more context setting would have helped. Are the Masai, for example, the victims of conservation or the great survivors of the African plains? Their expansion a few hundred years ago was achieved by a mix of cattle raiding and displacing the tribes living on the land at the time. But disease, and displacement by the colonial British powers who took much of their land for agriculture, greatly reduced their area of influence. The Masai and the wildlife they co-existed with were forced into ever smaller areas and the challenge of co-existence began. The bottom line is that neither people nor wildlife really have enough space. This book charts the history of how one movement, conservation, tried to tackle this fundamental dilemma in an often far from just way. It is a history worth telling – and one that is often uncomfortable reading when told with the passion of Mark Dowie.



Local tradition bearers such as Fionnlagh MacLeòid / Dr Finlay MacLeod of Shawbost, and author of the Corn Mills book reviewed here, both care for places like St Bridgit's Well here on the Isle of Lewis and carry stories that encode the principles of community resilience. - see review of his corn mills book in this edition.

Photo: Alastair McIntosh

The book charts the recent plight of a depressingly diverse group of indigenous people around the world in great detail. The hundred years of history takes us back to the designation of the first National Parks in the US and the replication of an exclusionary model of 'wilderness conservation' around the world. Its legacy is a conservation success which is now being enveloped in a mire of conservation conflict. If history could be rewritten we might perhaps wish for the sacred mountain of Bogd Khan in Mongolia, now acknowledged by many as the world's first protected area, to have been a better exemplar for the conservation movement.

Much of the book is an attack on the conservation ethic of the so-called

BINGOs (Big International Non-Governmental Organisations). While some see these organisations as attempting to save an over-exploited world, others, including Dowie, are worried by their size and the power that their multi-million dollar budgets endow. Given the increasingly polarised nature of this debate I am not sure that the sheer anger with which much of this book is written will really open the eyes of many conservationists (who'll probably be too frustrated to get beyond the first few pages) or will help foster relationships between indigenous people and conservationists, as the former will be, rightly, outraged by the reporting of the BINGOs' activities.

Personally, I do not think this book is about the 'good guys v the good guys'.

Instead it is about how some in the conservation world continue to ignore international guidance and best practice in relation to protected area establishment and management and fail to see how we can all work together (men and women, local and indigenous) to protect our rapidly decreasing cultural and natural diversity. When that history can be told our library shelves will be much enhanced.

Sue Stolton

THE NORSE MILLS OF LEWIS/Muilnean Beaga Leòdhais
Fionnlagh MacLeòid / Finlay MacLeod
Acair Ltd, Stornoway, 2009, 120 pages
Hbk, £15, ISBN 978 086152 3627
Available from: www.MillsArchiveTrust.org

A PICTORIAL 'DAADER TROWE' SHETLAND'S CROFTING CULTURE
Illustrating the role of the Shetland Coo - A Breed from the Past with a Place in the Future
Shetland Cattle from Shetland Breeders' Group, 2009, 232 pages
Hbk £20, ISBN 978 095637 0105
Available from: Anderson & Co, 60-62 Commercial St, Lerwick, 01595 693 714

This most loving crafted book available in both Gaelic and English editions and beautifully illustrated by John Love will become the definitive work on the old "Norse" corn mills of the Isle of Lewis. A technical account of how these run-of-stream mills worked, it is above all a complete study in human ecology, showing how family mills were central to village life, the cycle of the agricultural year, and to the customs and folklore of an indigenous peoples, the oldest of whom have remained with us to the present generation.

From about the 18th century, a new breed of landowners built their own large-scale mills and auctioned off the right to extract payment of "multure" on the milling. Men were sent round to smash village millstones to force compliance. These shattered stones can still be seen in the many lovely glens for which "Dr Finlay" gives map references and brief descriptions - in the same manner as his earlier books on the healing wells and ancient chapels of the Western Isles.

A study like this shows the sheer ingenuity with which resilient communities can sustain local food security when hefted to their place. The same comes through in the rich compilation from the Shetland Breeders' group about their beloved Shetland cow, complete with a foreword by that great friend of Scottish crofting, Prince Charles.

Just as the Norse mills were a keystone to Hebridean agriculture, so was the entire system of human ecology that revolved around Shetland cattle. In both English and glorious Shetland dialect and with stunning photographs a selection of island voices tell us about this rare breed - so small in stature and appetite, but big in milking generosity and versatility. We learn of the crofters' social interactions, music and art, traditional housing with its integral cow's byre, and related crop production including turnips, oats, kail and bere - the ancient barley. For these Shetlanders, their "coo" is not just the past but also for the future as oil prices rise and local self-reliance may become imperative once more.

I remember in 2007 talking to a crofter in Durness, the most northerly village of mainland Scotland, and asking where he got his oat seeds from.

He said he didn't want new-fangled strains from the south. To be sure of growing in his locality required seed sent down from the Northern Isles. "The seed must move from north to south," he told me, and both books reviewed here suggest such reciprocity also to be cultural.

Alastair McIntosh

THE HANDBOOK OF SUSTAINABILITY LITERACY Skills for a changing world

Arran Stibbe (ed)

Green Books, 2009, 220 pages

Pbk, £14.95, 978-1-900322-60-7

www.sustainability-literacy.org

UNCIVILISATION

The Dark Mountain manifesto

Paul Kingsnorth & Douglas Hine, 2009

www.dark-mountain.net

The first of these documents is an earnest encouragement to look at skills and attitudes we shall need if we are to change the ways we do things in the direction of 'sustainability'. The second is a clarion call concerning some of the same. The first is directed especially at people involved or interested in education; the second is primarily for evangelising writers and their readers. Both are intended to help us in a period that the earlier Chinese would probably have thought unfortunately interesting.

'Literacy' is used in the sense of being empowered by being literally and metaphorically able to 'read' our culture. In the 32 essays of part 1 of *The Handbook*, Stibbe and his contributors identify particular 'reading' needs and skills, briefly explore their importance in socio-

environmental terms, and indicate some of the ways we might (re-)acquire and hone them. For example: Stephen Quilley on 'Transition' skills, Justin Kenrick on 'commons' thinking, Patrick Whitefield on permaculture, Stephen Sterling on ecological intelligence, John Blewitt on new media, Zoe Robinson on the greening of business, Paul Maiteny 'finding meaning without consuming', and Ling Feng looking at the Zen attitude to 'effortless action'.

The essays individually do not have space for much detail; and inevitably some are more effective, others less so. I found Sterling's and Ling Feng's particularly interesting, and others on advertisements, being-in-the-world, and beauty. Exercises are suggested, to ease readers (groups) into the various literacies, but they tend to be too briefly described, and some seem quite nebulous. Much of the content is generally familiar to conservationists, but some isn't yet should be. This collection gives quite a good overview – though nature conservation could feel underemphasised, and some of the ecological skills identified by writers elsewhere in this issue of *ECOS* as lacking may well be needed for sustainability.

The Transition movement and permaculture are invoked as examples of steps in the right direction, though many more are needed. The writers mostly seem aware of the scale of this task of re-skilling a society that has neglected some useful 'literacies' during our cultural progress away from a (supposed) earlier integration with the rest of the world, and in which, more recently, the spread of specialisation, professionalism, and (oh paradox!) education, has denied most members the chance to practice old skills or learn

new ones. It is, then, not clear why, in part 2, four contributions on the final score of pages deal with the broad topics of the learning society, citizen engagement, re-education, and - a hard one - institutional transformation. This is very limiting. Nonetheless, this *Handbook* is stimulating, and will help some people, both learners and teachers, cope better with interesting times. I hope it is taken further.

The 19-page *Dark Mountain Manifesto* is firmly un-evangelical.... The old claim that, though slower, soap and education dislocate new-met societies more thoroughly than guns has merit; however, the greatest danger for other cultures *and* our own is a story we (i.e. the usual suspects) tell everyone we meet. "If we are indeed teetering on the edge of a massive change in how we live, how society itself is constructed, and how we relate to the rest of the world, then we were led to this point by the stories we have told ourselves – above all by the story of civilisation. "This story, a myth in the formal sense, is that age by age things get better and better, despite apparent setbacks, and it echoes from so deep in our history, and is repeated so often, that we accept it as – or as if – god-given. Its title is 'Progress', and its punchline is "One day all will be perfect".

In our capitalist age, this myth in the everyday sense is elaborated very enticingly: "The Next Life may be perfect (if &c....), but you can all be rich in this one". A few are not convinced. *The Manifesto* is an attempt to turn down the influence of the story of (our) civilisation's march ever-upward, by developing stories to tell about a world that is not dominated by a human-centred world-view, in which

consumerism isn't a moral good, where (modern) scientific rationalism isn't pre-eminent, and where human culture is eco-friendly. We have always lived by stories, and discarding one's culture-story is tricky – especially when one has forgotten it is a story. The whole business is taboo. The mission is, after all, to *uncivilise*....

The *Manifesto's* title and subtitle come from the poetry of Robinson Jeffers. Its writers hope that it is the first stage of an adventure to dislodge the civilisation myth and see established stories that tell of humankind as but one kind of being in a web of beings, and that tales of our separateness, the inexhaustibility of 'resources', and an end-of-the-rainbow perfection, are fibs. For "the myth of progress is founded on the myth of nature... The very fact that we have a word for 'nature' is evidence that we do not regard ourselves as part of it [*sic*]", but believe that civilisation will distance us from it. Encouraged by signs of the old story losing ground, the *Manifesto* writers aim to provide a magazine forum for uncivilised writing. Names suggested on the website as torchbearers (for what they emphasise is not 'nature writing') include Cormac McCarthy, David Abrams, Jay Griffiths, and (sometimes) D.H. Lawrence and E.M. Forster. Lew Welch, quoted by John Danvers in the *Handbook*, looks like another: "Step out onto the planet. / Draw a circle a hundred feet wide. / Inside the circle are / 300 things nobody understands, and, maybe / nobody's ever really seen. / How many can you find?"

The *Manifesto* ends with 'The Eight Principles of Uncivilisation'. Number 5 states: "Humans are not the point and purpose of the planet. Our art will begin

with an attempt to step outside the human bubble. By careful attention, we will re-engage with the non-human world". The *Manifesto* addresses writers, but these are seen as a subset of artists. "In the age of ecocide the last taboo must be broken – and only artists can do it". The attempt, they say, is too important to be left to politicians, conceptual thinkers, number-crunchers..., or to activists and campaigners. It will require word-weavers who do not bury themselves in theories and ideologies, but who have "dirt under their fingernails". Have we the skills for a narrative form of permaculture?

Martin Spray

HEAVEN AND EARTH Global Warming: the missing science

Ian Plimer
Quartet Books, 2009, 503 pages
Hbk £25.00, ISBN 9780704371668

THE CLIMATE CAPER

Garth W. Partridge
Quartet Books, 2009, 111 pages
Pbk, £10.00, ISBN 9780704371767

Australia is a hotbed of climate scepticism. It even has a newly formed political party based upon opposition to emission cuts, or rather their cost. Plimer is a respected professor of geological sciences and more than half of the book is taken up with the context of earth-changes and climate over millennia. He makes it immediately obvious where his analysis leads – as stated in the endorsement by Vaclav Klaus, then President of the European Union – "his truly interdisciplinary knowledge dismantles the currently popular, politically correct but rationally

untenable and indefensible position that the Earth is approaching catastrophic climate change and that we have to react, at all costs, to prevent it".

Having written a critical review of 'global warming' science myself and come to much the same conclusions, I ought to welcome such an academic ally, especially with regard to ill-conceived mitigation strategies, but whilst the book contains a mass of useful data and references, it is not coherent enough to impress against the monolith of anthropogenic global warming. It has been severely treated in reviews in *The Times* and *The Guardian*.

Plimer's critics accuse him of broad unsubstantiated conclusions and distortion – and sadly, these criticisms are well founded. The style of the book does not help, with endless disconnected paragraphs leaping from one fact or topic to another without effective integration into an argument. The figures are not referenced to the text, some contain serious errors in tabulation, and sources for data are seldom given. Captions on the figures make sweeping conclusions that really need to be tied into substantial argument in the text.

His first figure is one of the worst examples. It shows global temperatures from 1990 to 2008 compared to predictions from models with rising carbon dioxide concentrations. Global temperatures rise, form a plateau and then drop, whereas the models appear to have predicted a continuous linear rise. He concludes in the caption: "this diagram shows that the hypothesis that human emissions of carbon dioxide create global warming is invalid". It

doesn't of course. It deals only with an 18 year period and shows no relation to the previous decades. He has not dealt with ocean warming and time lags – which he does later – and this is an argument that can cut both ways. Most irritating to climate modellers, he has represented their projections as a single line, when they would argue that the downswing in global temperatures (where the plateau falls from 0.4 to 0.2) is encompassed by the full spread of variability in the models – even if they have to go to the 95th percentile!

If an author is going to write 500 pages on interdisciplinary climate science, he has to do better than this if he is to dent the edifice of politically correct climatology. The models are suspect in my view, but his language is altogether too loose and often contradictory. In one sentence he will categorically state that carbon dioxide cannot be responsible, and it is the sun that drives climate, and in another that greenhouse gases may indeed amplify natural warming. He states that models did not predict the current 'cooling' but does not explain that modellers know full well these limitations and sought to mimic sufficient decadal variability to account for warming and cooling cycles.

In another rather crucial figure showing the operation of warming and cooling cycles over the past thousand years – the main plank of any critique of global warming theory, he outlines the pattern of higher temperatures during the Medieval Warm Period and the modern 20th century maximum in comparison with the various minima – at almost two hundred year intervals, including the Little Ice Age (these global dips get deeper until the last in 1600 -1800AD). But again the figure just

hangs in the relevant chapter on the sun without reference to the arguments. And there is a bad error as the temperature change is measured as plus or minus 10 -15 degrees C instead of 1 to 1.5 C. There is no explanation of where the temperature measurements come from (they have to be from proxies). This graph is then compared to one of variation in carbon-14 isotopes as proxies for solar activity. This correlation is well known and the prospective mechanism subject to heated debate – but Plimer simply asserts that the lack of sunspots causes the cooling.

There is a valid hypothesis that lower solar magnetic activity (few sunspots) allows more ionising radiation to create more cloud – and he rehearses this argument later with appropriate references, but does not reference the counter-arguments. He states flatly that the IPCC ignored this 'missing' science. That is too simplistic. IPCC dealt with the science but said they were not convinced. In fact, there are several potential mechanisms and they may all have a role.

However, this book does have strength and value in the treatment of geological history and human cultural history in relation to climate, particularly during the late Holocene. The treatments of change in the Sahara 4000 years ago, of the demise of the Egyptian first kingdom, the Mayans and Anastasi, and the patterns of global drought should be required reading as a reminder of the power of natural cycles. In our own backyard, the misery of the Little Ice Age and the Dark Ages with regard to famine and disease, storms and floods, are particularly pertinent.

Additionally, there is an extensive treatment of sea-level rise that places the current scare in context (sea level rise is not at all beyond natural variability). But he runs into tricky territory over the sources and amounts of carbon dioxide and the use of isotopic ratios to identify those sources. He seems to be implying that the atmospheric build-up is natural. In this he flies in the face of massive opposition and to argue against it he needs to be a lot more coherent. He may be right. There are major uncertainties on sources and sinks, and the oceans outgas and re-absorb 15 times human annual emissions, so any decadal level variation here will strongly affect the build-up, but he lost me on the isotopic detail.

In his final chapter on 'Air' he provides many illuminating insights into temperature measurement – there is much to enhance scepticism on how much the recent warming really stands out from natural variability (I agree that it does not), but it is in such statements as "The Hadley Centre in the UK has shown that warming stopped in 1998", that he creates apoplexy among their orthodox climatologists. They will point out that the decade from 2000-2010 will be as warm on average as 1990-2000, and that was warmer than 1980-1990. They work with trends. It is 0.13 C per decade for those three decades, slowing from 0.2 C/decade from 1980-2000. It actually drops to 0.07/decade if we go back to 1940 (three decades of cooling) and if we go to 1900 it is 0.09/decade. At these rates 2100 will see a 0.7-1.3 C rise which is in line with the lowest estimates for doubling carbon dioxide, and not a significant departure from natural conditions – but of course, the

modellers anticipate an enhanced greenhouse effect and all manner of positive feedbacks that might kick in. By referencing the distant past when carbon dioxide levels went above 2000ppm (compared to 380 today) Plimer makes a good geological case against such a runaway scenario.

I think he comes to the right conclusions – that natural cycles have driven the warming and that carbon dioxide has been grossly over-played by modellers and those parties that have taken up the battle to save the planet. His arguments will bolster the essentially right-wing conspiracy theories of global governance and carbon stealth taxes, but it is hard work to garner the science case among the slip-ups on graphics and sweeping over-statements – none of which are necessary.

The Climate Caper is an entirely different kind of book. Garth Partridge is an atmospheric physicist with experience of government organisations – a former director of the Institute for Antarctic and Southern Ocean Studies. However, he deals less with the science as with the shenanigans of the IPCC, the nature of consensus and the shifting politics of the science. I agree with his conclusion – that the processes of science have been seriously corrupted by the politics of global warming and that when this is more widely known, science itself will suffer.

Peter Taylor

A NEW CLIMATE FOR THEOLOGY

Sallie McFague

Fortress Press, 2009, 198 pages

Pbk, £12.99, ISBN 13:978-0-8006-4

DOWN TO THE WIRE: CONFRONTING CLIMATE COLLAPSE

David W. Orr

Oxford University Press, 2009, 261 pages

Hbk, £19.95 ISBN 978-0-19-539353-8

SUSTAINABLE ENERGY WITHOUT THE HOT AIR

David J.C. MacKay

UIT, Cambridge, 373 pages

Pbk, £19.95, ISBN 978-0-9544529-3-3

I have always loved Sally McFague's emphasis that biblical language should be understood less literally and more metaphorically, and that God is our deepest lover. So far, so good. But for me, her take on climate change theology is new wine in old skins. She displays a weary deference to Derrida's wordy postmodernism but little of the fire of spiritual essentialism. This might be a good book for middle class intellectuals new to eco-theology, but for me I'll thank her for her earlier work and leave it there.

In contrast, David Orr's *Down to the Wire* is a deep and inspirational work, albeit a book very focussed on America. In facing up to "the long emergency" environmentalists are in a quandary, he argues, because we "lack both deep explanation for what ails us and a larger cosmology or spirituality rendered into a coherent and plausible alternative story of our ecological maladjustments."

Our burning need is education for "transformative leadership" that redefines public consciousness. Such is the work of "applied grace", for only with eye of spiritual insight open can we "foster the traits necessary to a higher order of human behaviour, among which I include gratitude, openness, compassion, generosity, good-heartedness, mercy, tolerance, empathy, humour, courage, and attachment to nature."

Like most "green" contributions on climate change, both these books showed weaknesses in matching "zero carbon" adjectives – as applied, for example, to the greening of universities – to the bottom-line arithmetical nouns of thermodynamic possibility. This is where Cambridge physicist David MacKay's study of the possibilities and delusions of sustainable energy is a timely work of outstanding importance. He says:

"I'm concerned about cutting UK emissions of twaddle – twaddle about sustainable energy. Everyone says getting off fossil fuels is important, and we're all encouraged to 'make a difference', but many of the things that allegedly make a difference don't add up."

I include *Sustainable Energy Without the Hot Air* in this theological round-up because we need good science to serve theology, and vice versa. MacKay's lucidity, relevance and touching generosity of teaching technique are Godsend. Amen!

Alastair McIntosh

ECOS – the agenda for 2010

Thanks for your support through the 30th year of *ECOS*. Our coverage in 2010 includes the following scope, but please contact us if you have more to suggest:

- Marine and coastal access legislation – here at last, but what will it mean in practice?
- The ecosystem assessment – will we want it when we see it?
- Preparing for the cuts – will conservation budgets be slashed? Can green land-banking help? What might be commercialised and with what results?
- Social benefits of conservation and green infrastructure – how to use the evidence.
- Protected areas in 2050 – how creative dare we be?
- Alien and invasive species – the hit list and the innocent victims.
- Climate science and conservation: where now after Climategate and Copenhagen?
- Dogs and wildlife – are we ready to get strict?
- Commons and grazing – towards solutions to avoid fencing.

Web and design changes

We will also be introducing design tweaks to *ECOS* and our web site. The web site will allow comment and feedback on articles, so you can have your say, or watch others support or challenge the articles.

Go well in 2010...