



British Ecological Society

## **‘Making Space for Nature’: Ecological Implications of the Lawton Review**

**Report of a meeting organised by the British Ecological Society Conservation Ecology  
Special Interest Group: 19<sup>th</sup> April 2011**

**August 2011**

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### **The British Ecological Society**

The British Ecological Society (BES) is the UK’s learned society for ecology and the oldest of its kind worldwide, celebrating its centenary in 2013. The Society has approximately 4,000 members across the globe, many working in conservation practice and many more at the cutting edge of ecological research. The BES has nine Special Interest Groups (SIGs), reflecting the diversity of interests amongst members of the Society; from plant environmental physiology, to aquatic ecology and computational ecology. <http://www.britishecologicalsociety.org>.

### **The Conservation Ecology Special Interest Group**

The Conservation Ecology Special Interest Group brings together members of the BES interested in conservation science, policy and practice. The group provides a forum to debate issues in conservation ecology and facilitates networking amongst conservation ecologists. The group aims to communicate ecological science to the wider conservation community, facilitating uptake and informing greater effectiveness in conservation management. The current Secretary of the group is Mick Green ([conservation@britishecologicalsociety.org](mailto:conservation@britishecologicalsociety.org)).

## Summary

England's conservation areas do not currently represent a coherent and resilient conservation network. Establishing such a network across England would provide an effective response to the loss of species and habitats which has occurred in the past 60 years, for the benefit of people and wildlife. The vision of nature in England in 2050, expressed by the 2010 report, 'Making Space for Nature: a review of England's Wildlife Sites and Ecological Network' (the 'Lawton Review'), is one of enhanced biodiversity and resilient, functioning ecosystems, compared to 2000.<sup>1</sup> To achieve this however requires a step-change in how conservation action is implemented.

Progress in conservation management and species recovery has been made in recent times and the conservation community has a good basis in practice from which to proceed. The recommendations of the Lawton Review, including the proposals to develop so-called 'Ecological Restoration Zones', should be implemented on a large-scale, and properly planned according with approaches as outlined in the [Futurescapes](#) (RSPB) and [Living Landscape](#) (Wildlife Trusts) initiatives.<sup>2</sup>

There is also a need to consider innovative new approaches to conservation practice, reflecting the challenges which are posed to the persistence of species and habitats from climate and land-use change, human population growth, pollution and other drivers. Developing new tools to place a value on natural capital and refining those which exist, can help to ensure that nature is not overlooked within decision-making, or assigned a default value of zero, but that it is taken into account in the cost-benefit calculations which inform policy development. Mechanisms such as 'Payments for Ecosystem Services' can leverage new sources of funds for nature conservation.

Connecting people with nature is fundamental if the state of the environment in England and across the UK is to be improved. Too few people now have easy access to wildlife, consequently disassociating people from the natural world. The ecological science and conservation communities must improve communications with one another, with decision-makers and with the general public, emphasising the importance and significance of biodiversity and healthy, functioning ecosystems.

### Key points

1. Academic and applied ecologists must communicate with one another in order to develop a new generation of tools that help conservation planning and

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<sup>1</sup> Lawton, J.H. et.al (2010) Making Space for Nature: a review of England's wildlife sites and ecological network. Report to Defra. <http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf> [Accessed 29 July 2011].

<sup>2</sup> Post-meeting note: the Natural Environment White Paper for England, launched on 20<sup>th</sup> June 2011, contains a proposal to establish 12 'Nature Improvement Areas'(NIAs) through a national competition. See Footnote 11 for further details.

delivery in practice.

2. Academic and applied ecologists must engage with different communities of interest about the significance and value of the natural world; from policy-makers to the public.
3. Approaches to conservation have traditionally focused on species, with a recent shift in approach towards habitats and latterly to landscape-scales. Different approaches may appeal to different audiences; the public are largely motivated by species, whilst a focus on ecosystem services may appeal to decision-makers.
4. Placing a monetary value on nature allows the impacts of policy on biodiversity and ecosystem services to be understood better by decision-makers, and may leverage new sources of funding for conservation.
5. The significance of biodiversity must become embedded across all Government Departments.
6. The environment is facing serious pressure from the challenge to provide food and water security to a growing population, increased built development, pollution and climate change, amongst other factors, and these pressures will continue to grow. Ecologists must start to plan for the future now, working with current resources and constraints.

## Background to the workshop

By 2050, climate change projections suggest that England will see hotter, drier summers and warmer, wetter winters, with these changes being most pronounced in the south of the country.<sup>3</sup> These extremes of climate will put additional pressure onto organisms already stressed by other factors, including competition from non-native invasive species, land-use change and habitat loss.

A resilient and coherent ecological network can make a contribution to the survival of species under environmental change, allowing organisms to move through the landscape as the climate alters. There is already evidence from across taxa that the ranges of a number of species are migrating north and uphill due to climatic shifts.<sup>4</sup> A

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<sup>3</sup> Jenkins, G. J., Murphy, J. M., Sexton, D. M. H., Lowe, J. A., Jones, P. and Kilsby, C. G. (2009). UK Climate Projections: Briefing report. Met Office Hadley Centre, Exeter, UK. [http://ukclimateprojections.defra.gov.uk/images/stories/briefing\\_pdfs/UKCP09\\_Briefing.pdf](http://ukclimateprojections.defra.gov.uk/images/stories/briefing_pdfs/UKCP09_Briefing.pdf) [Accessed 10 August 2011].

<sup>4</sup> C. D. Thomas, E. J. Bodsworth, R. J. Wilson, A. D. Simmons, Z. G. Davies, M. Musche and L. Conradt, (2001). Ecological and evolutionary processes at expanding range margins. *Nature* 411, 577-581.

coherent ecological network across England's terrestrial ecosystems can assist such movements.<sup>5</sup>

In September 2010, the UK Department for the Environment, Food and Rural Affairs (Defra), published '*Making Space for Nature: a Review of England's Wildlife Sites and Ecological Network*'.<sup>1</sup> Professor Sir John Lawton CBE FRS, a past President of the British Ecological Society (2005-2007) chaired the independent panel of experts which produced the review, supported by a secretariat provided by Natural England.

The review sought to determine whether the current network of wildlife sites in England, currently under various degrees of protection, is ecologically coherent and resilient to a changing climate.

The Natural Environment White Paper for England, 'The Natural Choice: securing the value of nature', was published in June 2011.<sup>6</sup> The Paper addressed a number of the recommendations of the Lawton Review, including an announcement to establish 12 'Nature Improvement Areas' through a national competition, supported by £7 million in Government funding.

The British Ecological Society's Conservation Ecology Special Interest Group organised a meeting in April 2011, prior to the launch of the White Paper, to consider the 24 recommendations of the 'Lawton Review' and wider issues in conservation.

## Key points to emerge from discussion

- 1. Academic and applied ecologists must communicate with one another in order to develop a new generation of tools that help conservation planning and delivery in practice.**
  - a. There is a need for conservation scientists and practitioners to step outside areas where they feel most comfortable and to explore and adopt new approaches to conservation practice.
  - b. Translating what is known about ecosystems and biological communities into decision-making, action and tools is a challenge for ecologists but is necessary and important.

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<sup>5</sup> An 'ecologically coherent network' consists of connected areas which facilitate dispersal of species between them and which contribute to functioning, healthy ecosystems. This can be further defined as a network which: 1) interacts and supports the wider environment; 2) maintains the processes, functions and structures of the intended protected features across their natural range; 3) functions synergistically as a whole, such that individual protected sites benefit from each other to include the two objectives above and;

4) (additionally) may be designed to be resilient to changing conditions. [Ardron, J.A. (2008). The challenge of assessing whether the OSPAR network of Marine Protected Areas is ecologically coherent. *Hydrobiologia* 606: 45-53].

<sup>6</sup> Defra. The Natural Choice: securing the value of nature (2011). London: Stationary Office <http://www.official-documents.gov.uk/document/cm80/8082/8082.asp> [Accessed 29 July 2011].

- c. The development of new tools, such as those for biodiversity audit, and approaches, such as that based on ecological 'guilds' (see Annex 1,D), presents challenges for conservationists as these must be layered on top of existing understanding of ecological function and processes if management is to be successful. Despite these difficulties, such tools can prove very interesting and useful and further consideration of these approaches is needed.
- d. Deciding whether and how to adopt less traditional approaches to conservation, for example international species translocation, as advocated during the workshop (see Annex 1, C), is a challenge for the community but one which must be addressed.

**2. Academic and applied ecologists must engage with different communities of interest about the significance and value of the natural world; from policy-makers to the public.**

- a. Engaging with policy-makers and wider society about the importance of biodiversity and ecosystem services is fundamentally important. A recent report by the Institute of Ecology and Environmental Management (IEEM) has revealed that influencing skills and the ability to engage with stakeholders are gaps in competence within the ecological profession. Ecologists particularly need to improve their abilities to engage with policy-makers; to work within multi-disciplinary teams and to engage with local residents over environmental matters.<sup>7</sup>
- b. In linking to the wider public, beyond those already supporting nature conservation organisations, ecologists must encourage people to perceive nature as a benefit, underpinning a healthy, functioning environment, economy and society. Understanding people's motivations and behavior is an important part of understanding how to tailor messages to engage particular groups within society, and how the actions taken by nature conservation organisations and agencies, such as Natural England, will impact on people's lives.
- c. Conservationists must encourage the public, particularly those already supportive of conservation NGOs, to recognise that some change in ecological systems is inevitable in the future, due to the direct and indirect effects of climate change, population growth and other factors. This will necessitate a new, more proactive approach to conservation practice.

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<sup>7</sup> IEEM. Ecological Skills: Shaping the profession for the 21<sup>st</sup> Century. Phase 1 Research Report. The Management Standards Consultancy Ltd. July 2011. 118p  
<http://www.ieem.net/docs/Ecological%20Skills%20Project%20Final%20Report.pdf> [Accessed 10 August 2011].

- 3. Approaches to conservation have traditionally focused on species, with a recent shift in approach towards habitats and latterly to landscape-scales. In moving towards a landscape- scale approach, the importance of species must not be neglected; species are the focus of public interest in and engagement with nature.**
- a. A recent report by Natural England, 'Lost life: England's lost and threatened species', successfully generated media and public interest through its headline message that nearly 500 species have become extinct in England over the past two centuries.<sup>8</sup> The public care about species, as evidenced too by the more than 1 million members of the RSPB, the UK's largest conservation charity
  - b. The public have a major role to play in nature conservation; many already contribute as volunteer recorders, to environmental monitoring and to stewardship. The Wildlife Trusts depend on a network of volunteers (Annex 1, E) as does the 'biodiversity audit' and similar projects (Annex 1, D). In addition to amateur naturalists, many more citizens belong to non-governmental nature conservation and environmental organisations: Wildlife and Countryside Link members can count over eight million supporters. Empowering these individuals to engage with policy-makers regarding decisions taken which affect the natural environment can be a positive force for change.
- 4. Placing a monetary value on nature allows the impacts of policy on biodiversity and ecosystem services to be understood better by decision-makers, and may leverage new sources of funding for conservation.**
- a. Whilst public enthusiasm and interest in conservation ecology may be generated through a focus on species, decision-makers' attention may be attracted more successfully by a messages regarding the importance and utility of ecosystem services.
  - b. Although the methodology underpinning the valuation of ecosystem services is in its infancy, frameworks exist which can be applied by ecologists, economists and decision-makers. The [UK National Ecosystem Assessment](#) offers one method of valuation, whilst Scottish Natural Heritage has developed a [Natural Capital Asset Index](#). A pilot project in Columbia and India, building on the results of the TEEB (The Economics of Ecosystems and Biodiversity), may demonstrate to other countries a means of incorporating the value of changes in ecosystems into national accounts.<sup>9,10</sup>

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<sup>8</sup> Natural England. Lost Life: England's lost and threatened species (2010). 53p.

<sup>9</sup> The UK National Ecosystem Assessment: <http://uknea.unep-wcmc.org/> [Accessed 10 August 2011].

<sup>10</sup> Scottish Natural Heritage.Scotland's Natural Capital Asset Index: <http://www.snh.gov.uk/docs/B814140.pdf> [Accessed 10 August 2011].

- c. A focus on the valuation of ecosystem services in policy may feed into the generation of additional sources of funds from new routes, such as through Payments for Ecosystem Services schemes. If funding for the delivery of ecosystem services is generated in this manner, for example for the restoration of peatlands or delivery of agri-environment schemes, this could free up existing funds for use in the conservation of vulnerable or threatened priority species.

**5. The significance of nature must become embedded across all Government Departments.**

- a. A step-change in nature conservation will require political will across Government, not simply in the Department for the Environment, Food and Rural Affairs (Defra). A major challenge is to understand how regard for the environment can be integrated across Government Departments in as simple a way as possible. The importance of the environment is increasingly presented to decision-makers as the importance of ecosystem services, which are an order of magnitude more difficult to manage than biodiversity given their multifaceted ecological characteristics.
- b. The Natural Environment White Paper represents the Government's response to the Lawton Review and offers an opportunity for the conservation ecology community to engage with, and hold to account, Government as a whole in taking forward the commitments within this.

**6. The environment is facing serious pressure from the challenge to provide food and water security to a growing population, increased built development, pollution and climate change, amongst other factors, and these pressures will continue to grow. Ecologists must start to plan for the future now, working with current resources and constraints.**

- a. Useful frameworks and legislation exist which the conservation science and policy communities can build on to better safeguard habitats and species in England. Reform of the Common Agricultural Policy (CAP) and efforts to ensure that a greater proportion of funding is diverted to 'Pillar 2', to support agri-environment schemes, is one example. A further opportunity is presented by the planned revision of the EU Directive on Environmental Impact Assessment (EIA) in 2012, aiming to improve application of this legislation.
- b. Current trends towards deregulation and decentralisation of decision-making on the part of Government offers challenges however, particularly with respect to planning reform. Conservation ecologists should engage with these developments by supplying information and advice, to ensure that the new systems put in place are not detrimental to the natural environment or biodiversity.

- c. Adopting innovative approaches to nature conservation, whilst abiding by the precautionary principle and practicing adaptive management, has the potential to generate interest and enthusiasm for conservation amongst policy-makers, the public and others.

## **Annex 1: Speaker Presentations**

### **A. [An overview of the Lawton Review: Professor Sir John Lawton](#)**

The Lawton Review, 'Making Space for Nature', sought to determine whether the current terrestrial protected area network in England is effective and if it will stand up to the threat of future climate change, to the year 2050.

Within the Review, wildlife sites in England are classified into three tiers, depending upon the level of protection each receives. The primary purpose of 'Tier 1' sites (6.9% of England's land area) is to conserve nature and these enjoy the highest level of protection. Tier 1 sites include Sites of Special Scientific Interest (SSSIs) and wetlands protected under the RAMSAR convention. 'Tier 2' sites are designated for their high biodiversity value but do not receive full statutory protection, for example Local Wildlife Sites. Finally, 'Tier 3' sites (23.5% of England's land area) are designated for wider environmental reasons than nature conservation but can have positive benefits for conservation, such as National Parks. There is much overlap between 'Tier 1' and 'Tier 3' sites; for example, 25% of all National Parks are SSSIs.

Currently, approximately 13% of England's land is designated for conservation purposes ('Tier 1' and 'Tier 2' sites), falling short of the 17% recommended under the [Convention on Biological Diversity's Aichi Targets](#). Of those sites which are designated, the majority are extremely small: at present, 77% of SSSIs and 98% of Local Wildlife Sites are below 100 hectares in size. In some areas of England, the loss of habitat has been so great that the area remaining is no longer sufficiently large to buffer against edge effects and thereby halt further losses without the aid of concentrated conservation efforts. As an example, 97% of semi-natural grasslands have been lost in England and Wales since the 1930s. In addition many of the current sites are poorly managed, whilst continual loss of 'stepping stone' habitat from the wider landscape results in these sites becoming isolated, with species no longer able to disperse through a network.

The current network of wildlife sites in England is necessary, but not sufficient to prevent further loss of species in this country. It is neither coherent nor resilient. The solution, proposed by the Review, is 'more, bigger, better and joined' wildlife sites. In practice this means that the quality of current sites must be increased through better management; current sites must be enlarged; new sites must be created where possible with respect to the habitat type in question; connections between sites must be created using wildlife corridors and stepping stones, whilst pressures on wildlife must be ameliorated by improving the wider matrix and creating buffers to protected areas.

As a priority, existing sites must be managed better, bigger sites should be created and further sites should then be added, with enhanced connectivity between sites through the creation of new corridors. A major recommendation of the Review is the creation of 12 Ecological Restoration Zones; sites identified through a national competition and where these principles can be applied across a significant scale.<sup>11</sup>

The cost of implementing the 24 recommendations outlined in the Lawton Review, including the creation of Ecological Restoration Zones, is between £600 million - £1.1 billion per annum. Although seemingly high, implementing many of the recommendations would help the Government to meet other objectives, including the provision of spaces for recreation (with consequent health benefits), as well as 'soft' engineering solutions to flood control and coastal protection. Recent projects undertaken by water companies have shown that the benefits of conserving and managing the environment outweigh the costs of either doing nothing or paying for technological solutions. As an example, Ofwat has recently ruled that water companies can pay land-owners to improve the quality of land in the catchments surrounding their rivers as it is cheaper to maintain functioning ecosystems upstream, with their natural water filtering capacity, than to treat the water downstream.

**B. Implementing Making Space for Nature (MSFN): Challenges and opportunities: Dr Pete Brotherton, Natural England**

The former Secretary of State at Defra, Hilary Benn MP, commissioned the Lawton Review in response to a paradox; England was making good progress towards the target of 95% of Sites of Special Scientific Interest (SSSI) reaching 'favourable' or 'recovering' condition but biodiversity was still in decline. In considering England's network of wildlife sites, the Lawton Review has made a number of recommendations regarding how the conservation performance of protected areas can themselves be improved, not least by enhancing the connections between them.

A significant finding of the Lawton Review is that we need both thriving populations of species within better buffered protected areas and an improved landscape which allows species to disperse between sites, by creating new habitat and improving the links between habitats. An improved ecological network across the landscape will make it easier for species already thriving to disperse. Investing to improve designated sites is equally important in order to assist the recovery of rare species and improve the quality of their habitats.

Currently there are 4,000 SSSIs in England, comprising 6.1% of the landscape. Most of the remaining priority habitat in England, making up 13% of the landscape, is now found

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<sup>11</sup> Post-meeting note: the Natural Environment White Paper for England, launched on 20<sup>th</sup> June 2011, contains a proposal to establish 12 'Nature Improvement Areas' (NIAs) through a national competition. This is intended as a pilot phase, supported by £7 million in Government funding. The NIAs reflect the recommendation of the Lawton Review and will be identified 'based on a local assessment of opportunities for connecting and restoring nature on a significant scale'. Initial applications to found NIAs are invited by autumn 2011, with a detailed second stage application by the end of the year: <http://www.defra.gov.uk/news/2011/07/14/wildlife-competition/> [Accessed 10 August 2011].

only in wildlife sites. Under the Convention on Biological Diversity, England has committed to 17% of the landscape under protected area designations by 2020.

As a result of the recommendations of the Lawton Review, Natural England will designate new SSSIs, where significant gaps in provision exist, taking projected future changes in climate into account when doing so. The Countryside Council for Wales is also beginning to designate networks of sites, taking into account meta-population dynamics (for example, of the Marsh Fritillary butterfly). Natural England can also play a role in incentivising land owners and managers to be better stewards of their land, setting standards and gathering information from them to allow agri-environment schemes to be run more effectively.

Challenges exist to improving the management of protected areas. Only 36.6% of England's SSSIs are currently in 'favourable' condition. The majority of those which remain are classed as 'unfavourable recovering', whilst 3.3% are recorded as 'unfavourable no change', or 'declining'.<sup>12</sup> It is proposed that 50% of the SSSIs in England will be in 'favourable' condition by 2020. Many of the factors which impinge on the condition of an SSSI are found beyond the site boundaries, including diffuse pollution and invasive non-native species.

Managing Local Wildlife Sites effectively presents an even greater challenge. When surveyed, none of the 100 non-SSSI heathlands examined were found to be in a favourable condition. Land owners need to be notified of the need to manage Local Wildlife Sites as many are unaware of their responsibility for these areas. The conservation sector must improve in its communication with land owners and managers.

Managing National Parks and Areas of Outstanding Natural Beauty more effectively for wildlife conservation could contribute significantly to England meeting the Convention on Biological Diversity target of 17% of landscapes under management by 2020.

The focus of site management needs to change; from individual species to ecological processes and habitat heterogeneity. Heterogenous environments encourage species diversity and will allow for species to adapt better to future climate change. Changing management strategies on single small sites may pose high risks to current biodiversity, but this approach could be achieved on larger sites and across networks.

In shifting from managing individual wildlife sites to managing networks, how objectives will be set and monitored must be considered, as well as whether management is practical and cost-effective. Achieving buy-in from landowners and local communities will be important, as will overcoming perceptions that plans for conservation may limit local economic growth. Funding for wildlife site and network creation and management

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<sup>12</sup> Natural England. SSSI Condition Summary, 1 July 2011  
<http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?Report=sdrt15&Category=N&Reference=0>  
[Accessed 10 August 2011].

must be long-term, whilst the likely impact of climate change on the viability of existing and proposed sites must be taken into account when networks are planned.

There are several challenges to the creation of new habitat as part of a conservation strategy in England. The first is that this is a new field within ecological science and conservation practice and that experience in habitat creation is limited. The space available in England for habitat creation presents another difficulty as there are multiple demands on land, which are only increasing. A further challenge is the danger of spreading limited resources too thinly.

Nevertheless, there is great potential to augment and improve the existing network of wildlife sites in England. Capturing the value of biodiversity to a greater extent than presently may provide opportunities to fund network creation and to highlight the importance of wildlife sites to those whom conservationists need to engage.

C. [Biodiversity in a changing climate: Professor Chris Thomas, University of York](#)

The distribution of many species is changing due to climate change, with shifts in the northward range boundaries of many animal species of approximately 2 km<sup>2</sup> per year. These changes present both challenges and opportunities for conservationists. A particular challenge is to assess protected areas against benchmarks for condition, established in the past, when community compositions are changing.

Alterations in community composition may mean that traditional management practices are no longer suitable. Conservation methods themselves need to adapt as the climate alters.

Even when taking a landscape- scale or ecosystem approach to conservation, conservationists must not lose sight of key species. If conservation effort is not focused on species, there is a danger that measures will be implemented that benefit those species which are not threatened in any case, thereby not making best use of limited resources.

A framework developed by Prof. Thomas and colleagues proposes a method to assist conservationists in ensuring that conservation effort is concentrated in areas and on species of most need, as the climate changes.<sup>13</sup> To apply this approach, conservationists must initially consider the observed rate of decline in a species *within* its recent historical range, and assess whether this is likely to be linked to climate change or other exacerbating factors – such as small range size. The projected rate of decline in a species within its recent historical range, under different climate change scenarios, is then assessed, using a model. Observed declines, and projected increases (generated via models) *outside* a species recent historical range are then considered. The results of these analyses are then processed to generate a measure of climate related decline and

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<sup>13</sup> Thomas, C.D. *et al.* (2010) A framework for assessing threats and benefits to species responding to climate change. *Methods in Ecology & Evolution* DOI: 10.1111/j.2041-210X.2010.00065.x.

a measure of expansion for the species. On this basis, the species is assigned to one of six threat categories. Once the relative risks and benefits to the species of climate change have been assessed conservationists can consider how they can assist species' survival, for example by ameliorating other pressures upon them, and which species should be afforded priority. When tested, the framework has generated results, considered acceptable by ecologists consulted, regarding which species should be targeted for conservation action, suggesting that it could prove to be a useful tool.

Recent modelling work has demonstrated that linking up existing patches of heathland, grassland and woodland could lead to an increase in the rate of spread of species, with the magnitude of effect proportional to the amount of additional habitat.<sup>14</sup> An important finding from the study was that although linking habitats was beneficial to the spread of species, simply adding additional habitats also had a positive effect. Practicality often drives the location of new habitats; this finding shows that simply increasing habitat could play a positive role in species conservation. These habitat patches should be large and of high quality; extremely important for the persistence of source populations and as localities for colonisation.

An increasingly proactive, international approach to conservation must be taken. Internationally threatened species, for which linking up habitats is impossible or prohibitively expensive, could be translocated. Conservationists in the UK should increasingly target species for action which are internationally significant in Britain or for which Britain could become important as climate change affects their status elsewhere. Foresters are increasingly planting trees from provenances that are projected to flourish under future climatic conditions in the UK; an example of species translocation which might inform good conservation practice.

**D. The Biodiversity Audit: Setting the priorities and evidence base for conservation: Dr Paul Dolman, University of East Anglia**

Breckland and Broadland, two biogeographic regions of East Anglia, were the focus for the Biodiversity Audit project. Breckland and Broadland are both [National Character Areas](#), as categorised by Natural England.

The Biodiversity Audit research team assessed the biodiversity in the Breckland and Broadland regions, comparing these results with the Biodiversity Action Plan (BAP) for both. The BAP includes 1,150 priority species and 65 priority habitats, identifying them as most threatened and requiring conservation action. The BAP for the Breckland National Character Area lists 45 species; in contrast, the team discovered nearly 13,000 in their assessment of the region. Of these, 2,149 were 'priority' BAP species, or Nationally Rare. In Broadland, the research team counted over 12,000 species, of which nearly 2,000 were of conservation priority. The conclusion of the Biodiversity Audit was

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<sup>14</sup> Hodgson, J. A., Thomas, C. D., Cinderby, S., Cambridge, H., Evans, P. and Hill, J. K. (2011). Habitat re-creation strategies for promoting adaptation of species to climate change. *Conservation Letters*, 4: 289–297. doi: 10.1111/j.1755-263X.2011.00177.x

that the BAP priority species list does not adequately represent the biodiversity present in these regions.

Nationally Rare or Nationally Scarce species are important to the public and their presence at a site adds impetus to efforts to conserve an area. Yet many of these species were not picked up by the application of the BAP priorities to Breckland and Broadland.

Only 14% of the BAP species in Breckland were associated with a single habitat. Conservationists need to move away from habitat-based thinking, instead considering the features and processes which species require. To improve species representation and subsequent management in Breckland, the Biodiversity Audit team identified the ecological needs and requirements of the BAP species present and classified the species into 'guilds' based on 48 different micro-habitats and 28 different ecological processes.

The 'guild' approach is based on the understanding that species thrive in particular niches, sharing functional requirements, with some, for example, requiring grassland which has been disturbed through grazing and others undisturbed habitat. Conservation in the Breckland area, as in many conservation projects, had previously failed to reconcile the biodiversity present at the site with the needs of these species and therefore the interventions required for effective management. By adopting a 'guild' based approach, conservationists can begin to move away from a traditional focus on habitats to an approach which considers whole ecosystems. Locally adapted approaches are vital for success in species conservation.

Novel habitats, such as those found in post-industrial scrap yards and factory sites, have been proven to have real value for biodiversity. The 'guild' and Biodiversity Audit approach suggests that a species can thrive in unexpected places, provided its needs are met. Landscape connectivity can be enhanced once the needs of species are known.

The BAP is idiosyncratic, covering less than 1% of diptera, 2% of beetles and hemiptera, despite 25% being listed in the Red Data Book as 'Critically Endangered', 'Endangered' or 'Vulnerable'. Each 'guild' developed in the Biodiversity Audit process contains at least one BAP species, so the guild approach will deliver beneficial conservation interventions for those species considered a priority, whilst also allowing the needs of many others to be addressed. A conservation approach which considers guilds and functional groups integrates delivery across taxa and avoids the need for multiple species studies and plans.

Amateur expert knowledge was fundamental to the success of the Biodiversity Audit, with over 80% of the data collected by volunteer recorders. Published documentation on the species present in the regions, such as 'atlases', was also important.

E. [Practical delivery – The Wildlife Trusts’ ‘Living Landscape Programme’: Debbie Tann, Hampshire and Isle of Wight Wildlife Trust](#)

‘A Living Landscape’ was launched in 2006; a report to guide the vision and approach of the 47 Wildlife Trusts. ‘Living landscape’ is a Wildlife Trust brand for a landscape-scale approach to nature conservation. This is an aspirational vision, in which the UK’s environment is managed for wildlife and society. The vision of a ‘living landscape’ is to restore, recreate and re-connect habitats in order to recover wildlife. Restore’ in this context means ‘restoring processes’ and so habitat quality. Since the launch more than 100 schemes have been developed by the Trusts, across 1.4 million hectares of land in the UK.

An example of such a project is Winnall Moors, which acts as a ‘green lung’ for the city of Winchester and is a haven for wildlife. Previously the river was managed intensively for fly-fishing, with very little vegetation present. With £1.3 million of funding, the Wildlife Trust has restored the link with water meadows by breaking down banks and raising gravel beds with shale. Fisherman initially received the project negatively, however since the river has been less intensively managed brown trout have returned, thereby improving fishing opportunities.

A second such project, on a 1,800 Ha training estate owned by the Ministry of Defence in the Thames Basin Heaths, has introduced cattle, which graze the land to different intensities and therefore create a diverse habitat. The cattle are sold into farmers’ markets at a quality premium, whilst the hay from the fields is also sold, linking the project into the local economy.

These projects and others like them are funded by Higher Level and Entry Level Stewardship Schemes. Other potential sources of finance are donations and legacies, whilst sponsorship from the Co-operative is supporting the Thames Basin Heaths, selling the produce from the project in its supermarkets. In the future, Payments for Ecosystem Services and biodiversity offsetting may develop as significant sources of funding. Conservation organisations wishing to develop such projects must look beyond traditional sources of funding.

As with the Biodiversity Audit project, the involvement of volunteers is extremely important. The Hampshire and Isle of Wight Wildlife Trust has 700 regular volunteers who are involved as wardens or who take part in monitoring and in other activities. Engaging the wider public, and generating a committed community of interest, is extremely important if measures put in place for the protection of biodiversity are to be successful.