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Working together to make space for nature

Recommendations from a conference on large-scale conservation in England

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Working together to make space for nature

Recommendations for improving large-scale conservation in England

Langden Valley on the Bowland Estate, where RSPB is working in partnership with United Utilities. Jude Lane, RSPB

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The members of the steering group that organised the conference 'Working together to make space for nature' were:
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Contents

Introduction and outline

The Natural Environment White Paper published by the government in 2011[1] and the conservation strategy for England, Biodiversity 2020[2], both highlight the importance of establishing coherent ecological networks to benefit wildlife and people, and the consequent need to consider conservation at a large or 'landscape' scale. A strong policy direction and aspiration has therefore been established, strongly evident in the new Nature Improvement Areas established in 2012[3]. However, more needs to be done to identify the best ways to approach large-scale conservation, and to put in place appropriate measures to support it in the long term. This is particularly important as large-scale ecological restoration is a long-term process, requiring long-term planning, management and investment. We need to learn from both the scientific evidence and the extensive practical experience that has been built up in recent years.

To address this, a conference was held in 2013 by Natural England, in partnership with RSPB, the Wildlife Trusts, Butterfly Conservation and the National Trust. This was intended to provide an opportunity to review lessons learned and help establish priorities for developing and improving our approaches. The conference had the title 'working together to make space for nature'. This was a reference to the highly influential report by John Lawton and his colleagues published in 2010[4], which set out the principles underpinning much current effort. It also acknowledged the fact that conservation over large areas of land, especially in a crowded country such as England, inherently requires working in partnerships; this is not something in which any member of the conservation community can work in isolation. The conference brought together almost 100 of the leading thinkers, researchers, decision-makers and practitioners in the field, from more than 50 organisations (listed at the end of this report). This underlines the strong interest in the topic across the conservation community, as well as the number and breadth of organisations involved.

The event was designed to facilitate debate in a series of focused workshops, complemented by keynote speakers providing a range of expert perspectives and insights on the subject. The overall aim was to help the conservation community to move towards a common understanding of what we are aiming for in this field of conservation and what needs to be done to get there. The focus was on England, but most if not all the issues raised apply equally to other parts of the UK, and many are also relevant to other countries.

The first part of the conference consisted of a series of talks setting out new evidence and current thinking on a range of important topics. This included Chris de Grouchy from Defra on the role of large-scale conservation in current conservation policy; Bill Adams from the University of Cambridge on the growing prominence of 'large-scale' thinking in conservation; John Hopkins from University of Exeter discussing the species conservation angle and the relative importance of the 'better' 'bigger, more and joined' principles in *Making Space for Nature*; Paul Selman from the University of Sheffield talking about people and landscapes; Jemma Batten, from the Marlborough

[1] The Natural Choice: Securing the value of nature. http://www.defra.gov.uk/environment/natural/whitepaper/
[2] Biodiversity 2020: A strategy for England's wildlife and ecosystem services http://www.defra.gov.uk/publications/2011/08/19/pb13583-biodiversity-strategy-2020/
[3] https://www.gov.uk/government/publications/nature-improvement-areas-improved-ecological-networks/nature-improvement-areas-about-the-programme
[4] Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., & Wynne, G.R. (2010) *Making Space for Nature: a review of England's wildlife sites and ecological network*. Report to Defra.

Downs Nature Improvement Area, recounting the practical experience of setting up a large conservation project, and one that is notable for being led by local farmers; and Nicholas Macgregor from Natural England summarising some of the main findings from recent research by the Universities of Southampton and Cambridge and Natural England on large-scale conservation in England, Scotland and Wales.

The second half of the conference explored in detail questions that had been raised by the research by Natural England and its research partners[5], and by other recent studies[6]. Discussions were focused on four important topics:

- Measuring and monitoring results in large-scale conservation.
- Planning and implementing ecological networks.
- Working in partnership within and across conservation projects.
- Land and funding for large-scale conservation.

For each of these topics, workshop groups identified major issues, and agreed the most important four or five issues needing to be addressed. A second workshop session then explored each of those issues in detail, considering desired end goals and factors helping and hindering progress towards those goals, and formulating a series of required actions needing to be taken. Lists of the highest priority actions from the different workshops were brought together into a final plenary discussion, from which a series of recommendations was distilled.

This report summarises the main conclusions and recommendations from the conference. These are presented under the four topics addressed by the separate workshop discussions, but some obvious links and common themes are apparent. For each topic, a case study of a successful conservation programme or project is also provided. The remainder of the report provides short summaries of each of the plenary talks given at the conference, and a list of organisations that participated. We are extremely grateful to everyone who participated in the conference and the preparation of this report (all conference participants were given the opportunity to comment on an early draft).

The recommendations summarised in the report do not necessarily represent the views of any particular organisation. Nevertheless, they do represent the collective views of nearly 100 knowledgeable and experienced people from across a wide range of organisations with a stake and interest in this topic. We hope the report helps to articulate some of the major challenges and priorities in this field, and that organisations with an interest will consider what action they can take, individually and collectively, in response.

[5] For an overview, see: Macgregor NA, Adams WM, Hill CT, Eigenbrod F & Osborne PE (2012) Large-scale conservation in Great Britain: taking stock. *ECOS* 33, 13-23.
[6] For example: Ellis, S., Bourn, N.A.D, and Bulman, C.R. (2012) *Landscape-scale conservation for butterflies and moths: Lessons from the UK*. Butterfly Conservation, Wareham, Dorset.

Conclusions and recommendations

One of the free-ranging herd of Konik ponies that are used to graze the restoration land at Wicken Fen. Stuart Warrington, National Trust

1. Monitoring and evaluation of results in large-scale conservation

Monitoring and evaluation of large-scale conservation is essential. Although there are strong theoretical reasons behind the large-scale approach, we need to evaluate its success, determine the extent to which working at this scale delivers benefits beyond those that can be achieved through traditional site-based approaches, and learn from experience. Evaluation is also required to demonstrate that new initiatives really are part of a 'step change' in conservation rather than a new way of describing existing action.

Large-scale conservation initiatives have many characteristics that make monitoring and evaluation important, and sometimes challenging; these include:

- Multiple objectives, some of which are not easy to measure.
- The need for baseline ecological data (including good spatial data on species distribution and abundance or location of other environmental attributes) as well as for data on changing ecological status. This applies equally to those conservation initiatives that have specific targets and those that are more 'open-ended'.
- Adaptive management (i.e. learning by doing, including experimenting with different approaches) is, or should be, an important part of many initiatives. New approaches to conservation are being developed and we need to document and learn from the results.
- Much large-scale conservation is novel and challenging in terms of institutions as well as ecology. Social aspects, including partnerships, stakeholder engagement, volunteering and beneficiaries of ecosystem services, need to be considered alongside natural ecosystems.

Important issues identified at the conference

- Sampling design is important. A balance is needed between national consistency and some local flexibility. Structured, repeated sampling is needed, not just happenstance records.
- There is a shortage of skills in identifying plants and animals, and in sampling and statistical techniques.
- There is a lack of consistent data to measure change (spatial data & information about species). Consistent data collection is needed over the long term.
- There is a lack of comparability between large scale schemes because baseline data to provide controls / counterfactuals is missing.
- Measures and indicators should be linked better to objectives.

Some of the challenges and opportunities in addressing these issues

Opportunities	Challenges and constraints
• There is a great deal of existing monitoring, survey design and scientific information to build on. This includes baseline surveys: LCA, habitat surveys, species surveys, wild land mapping, NCAs, National Ecosystem Assessment. • There is available expertise in the UK to train people in recording/monitoring techniques. • Many people have an interest in and understanding of nature and landscape and so there is a potential pool of 'citizen scientists' to draw on. • There have been recent advances in technology, e.g. in remote sensing techniques and also in IT tools that could encourage citizen scientists. • The strategic policy drivers are in place – Biodiversity 2020; Natural Environment White Paper. • Economic austerity might in fact increase the demand for evidence of outcomes to justify further funding. • Planning & development is a driver for survey & monitoring. • Monitoring and/or evaluation frameworks have been developed for the Nature Improvement Areas and the Wildlife Trusts' Living Landscapes; these could be shared and applied elsewhere.	• Measuring 'nature' & 'people' is inherently complex, and a range of skills and techniques are required. Some tasks require more specialist skills than others, so an over-reliance on volunteers can constrain the monitoring that can be done. • There is limited funding for training and equipment and to employ specialist monitoring staff. • Scientific and spatial data exist but are not always easy to gain access to. • Messages from research findings are not always consistent or communicated clearly enough. • Existing surveys provide a starting point, but there is a lack of coordination across surveys; there is a multiplicity of special surveys with little coincidence of sites. • Conservatism & the need to show success can block innovation. • Policy commitments are often not stated in ways which relate to baselines / counterfactuals. • Identifying appropriate counterfactuals for complex projects involving changes in attitudes, behaviour or commitment amongst people is difficult. • Control sites don't necessarily provide a counterfactual. • Because of resource constraints, project managers can view baseline information, controls and counterfactuals as a low priority, and they are often unaware of how to address it in a practical and feasible way.

Recommendations

- Raise the profile of the need for monitoring, and try to engage organisations outside the traditional conservation sector so greater investments in resources follow. Encourage the use of 'citizen science and of 'smart technologies' that can increase efficiency of data collection.

- Develop a national flora and fauna identification skills project to train specialists & volunteers, involving partners from industry.

- National organisations & their partners should adopt common assessment criteria and mapping techniques to record the 'quality' or benefits provided by landscapes, so that academic and volunteer organisations can provide appropriate training and so that consistent monitoring can be done.

- Develop an online resource with:

    - Examples of best practice which describe monitoring/survey methods that explain the benefits for the project (e.g. future funding, or obtaining information to inform conservation objectives).
    - Sources of expertise that project managers can call on.
    - An emphasis on the need for baselines and counterfactuals.
    - Simple guidance for putting in place practical monitoring schemes.

- Funding grants must demand robust monitoring of the project's unique impacts, and ensure that funding for monitoring and for management do not compete with each other.

- Ensure open access to all data collected using public funds.

- Increase efforts to educate and encourage young people to learn to observe and record nature – work with schools to encourage the next generation. At the same time, maintain the valuable networks of older people that provide the current core of volunteer monitoring.

- Develop and apply social science expertise and tools to measure and evaluate societal responses to conservation initiatives.

Case study: Monitoring and evaluating the Wicken Fen Vision

Francine Hughes; Anglia Ruskin University

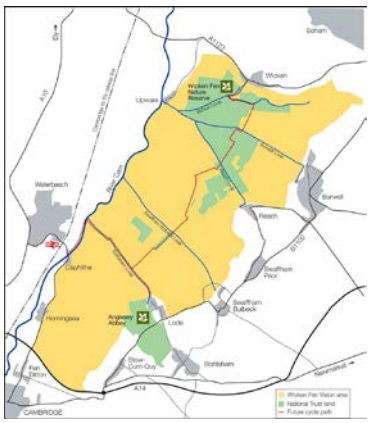
The National Trust's Wicken Fen 100-year Vision Project is a landscape-scale wetland restoration project and aims to create 5,300 hectares of new habitat between Wicken Fen NNR and the city of Cambridge. Large areas of arable land have developed into a habitat mosaic of wetland, wet grassland, dry grassland and scrub adjacent to Wicken Fen NNR. The project area currently covers 770 ha including the NNR. An 'open-ended' approach to restoration (Hughes and others, 2012) has been used which specifically does not set species or habitat targets but instead facilitates natural processes (within legal and other land use constraints) to determine the habitat and species outcomes of the land conversion. The natural processes are both biotic, e.g. vegetation regeneration and succession, and abiotic, e.g. fluctuating water table levels and periodic floods. Semi-feral grazing animals have also been introduced into the landscape to act as agents of ecosystem change. The new ecosystem's trajectory into the future will be influenced by many factors including its ecological inheritance (e.g. the seeds remaining in the seed bank and post-arable soil condition), the arrival and departure of plants and animals, soil hydrology and both antecedent and contemporary environmental conditions. It is quite likely to include novel species assemblages (e.g. including agricultural weeds).

When habitat restoration is carried out at a landscape-scale, we can expect to see landscape characteristics that were not previously there. We designed monitoring or surveillance activities to match these characteristics at the Wicken Fen Vision (Stroh and Hughes, 2010; Hughes and others, 2011) (Table 1).

Table 1. Examples of landscape scale restoration project monitoring protocols in the Fens

Characteristic of landscape-scale restoration project	***Expected changes relative to starting point***	***Activities to monitor these changes***
Larger areas of land available for use by plants and animals.	Arrival of visiting or breeding '*landscape species'* *, e.g. raptors, common cranes, roe deer, red deer or migratory birds Higher numbers of some species - wildlife spectacles not previously present.	Annual or 5-yearly counts of *'landscape species'.* Annual or 5-yearly counts of species that have appeared at Wicken Fen in large numbers, such as hobbies.
Higher levels of habitat connectivity through the landscape.	Arrival of species that have negotiated a new connection or gap in the landscape, e.g. butterfly species not previously present as well as landscape species.	For example, extensive invertebrate survey method designed especially for Wicken Fen Vision and Great Fen.
Greater heterogeneity of habitats reflecting a wider range of biophysical conditions and ecological processes within a larger area. These habitat mosaics will change over space and through time.	Development of novel and changing wetland and drier vegetation assemblages associated with novel edaphic conditions (e.g. novel soil structure and chemistry from past land use). Some may resemble habitats in the UK NVC but most will not.	Vegetation surveys to capture regeneration and succession. Comparison of vegetation in 2007 and 2012 using FCIR aerial photo-mosaics to describe change in heterogeneity and wetness of vegetation.
Active (both expected and random) ecosystem processes maintaining habitat heterogeneity.	Natural vegetation regeneration. More seasonally varied water tables. Seasonal flooding. Self-reliant, reproducing grazing herd. Arrival and departure of other grazing or browsing animals.	Continuous or monthly measurement of hydrological variables. Annual counts and observation of grazing/browsing animal numbers.
More opportunities for rare or specialist species to find a functional niche beyond current protected areas.	Arrival of *'Hotspot species'* – rare or specialist species that have previously been confined to Wicken Fen NNR, especially invertebrates and plants.	Annual or less frequent surveys that might locate animal or plant *'hotspot species'* previously confined to Wicken Fen NNR.
1. Higher levels of ecosystem service delivery *Some of these services have been measured using the TESSA toolkit for measuring ecosystem services (Peh and others 2013, 2014)*	• Decrease in carbon and increase in methane emissions	• Automated measurement of carbon and methane fluxes (by University of Leicester; Open University)
	• Improved water quality	• Annual Monitoring of *'environmental indicator species'*, e.g. aquatic macrophytes
	• Increased flood protection through water storage	• Monitoring of water tables in designated flood storage area
	• Increased opportunities for recreational, educational and aesthetic activities	• Monitoring of recreational use
	• Increased provision of grazing land	• Monitoring of grazing animals

*The term 'landscape species' has been borrowed from the Wildlife Conservation Society who define them as species that require large areas or that can manipulate the landscape, e.g. through browsing.



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2. Ecological networks

Ecological networks have been recognised as a crucial aspect of conservation, and a particularly important consideration in environments that have become fragmented by human activities. The *Making Space for Nature* report[7] defined an ecological network as "*a suite of high quality sites which collectively contain the diversity and area of habitat that are needed to support species and which have ecological connections between them that enable species, or at least their genes, to move".*

Making Space for Nature concluded that preventing further biodiversity loss in England will require concerted efforts as many of our wildlife sites are too small and large areas of habitat have been lost. In addition, wildlife sites are often isolated because natural connections have been degraded or lost. The report recommended that we need to:

1. Improve the quality of current sites through better habitat management.
2. Increase the size of current wildlife sites.
3. Enhance connections between, or join up, sites through 'corridors' or 'stepping stones'.
4. Create new sites.
5. Reduce pressures on wildlife by improving the wider environment, including buffering sites.

Large-scale conservation is well placed to do this, and many existing initiatives have been established with these approaches explicitly in mind. An implication of the findings of *Making Space for Nature* is that future ecological networks must be built on good management of existing sites and must learn from past conservation successes. Many of these successes have resulted from targeted action for particular species. Thus, there is a challenge to integrate 'traditional' site- and species-based conservation into large-scale conservation projects with wide objectives.

Important issues identified

- It is important to set appropriate objectives and plan conservation areas accordingly. Should the focus be on individual species, focal/umbrella species, habitats/vegetation types, ecosystems, processes? What are the synergies and tradeoffs?
- There is a need to combine a 'top down' systematic planning approach (to overall site selection and network design) with 'bottom up' pragmatic responses to opportunities and local interests.
- Designing ecological networks that are functional for a wide range of species with different ecological requirements, and planned as part of a 'landscape' or ecosystem approach.
- Public perception can be an issue, particularly if large-scale landscape change or arable reversion is involved.
- Sustained funding is needed for land acquisition and habitat creation at the necessary scales to create resilient networks.

[7] Lawton, J.H., Brotherton, P.N.M., Brown, V.K., Elphick, C., Fitter, A.H., Forshaw, J., Haddow, R.W., Hilborne, S., Leafe, R.N., Mace, G.M., Southgate, M.P., Sutherland, W.J., Tew, T.E., Varley, J., & Wynne, G.R. (2010) *Making Space for Nature: a review of England's wildlife sites and ecological network*. Report to Defra. Page vi

Some of the challenges and opportunities in addressing these issues

Opportunities and positive forces	Challenges and constraints
• There is a steadily growing ecological knowledge of species niche and habitat network requirements. • There is a high level of interest among the British public in the countryside and wildlife, demonstrated by the popularity of programmes about nature and landscapes. Better use could be made of charismatic species as flagships for landscape conservation. There is also potential to engage and inspire young people more. • There is a strong emphasis on networks and an 'integrated landscape-scale approach' in current policy (Bio2020, NEWP). The NEA also underlined the multiple values of the natural environment and presented the case for valuing it more highly, including in economic terms. • Some specific mechanisms such as biodiversity offsetting offer opportunities for creation of new sites. • There is a growing shared agreement and vision for large-scale restoration (e.g. in Nature Improvement Areas), growing clarity of messages, and growing partnerships and relationships between organisations, creating a strong foundation for future action. • Local authorities, organisations managing infrastructure (e.g. transport) and the planning process have an important role to play. • There is potential for charismatic individuals to catalyse and inspire action.	• There are knowledge gaps about needs of different species. • There are challenges and uncertainties associated with the complexity and unpredictability of ecosystems. Knowledge about ecosystem services is limited. • Knowledge of how to (re)create some ecosystems is lacking, and some take a very long time to restore. • There are challenges in combining multiple objectives (different species with varying resource requirements, ecosystem services, land uses) into single conservation areas. • Some land owners and managers are resistant to large –scale conservation; some have concerns about loss of land for other uses, including food production. • High level policies are not always followed up by political will and support for implementation. • Development pressures restrict potential for large-scale conservation. • Some conservationists are still sceptical about the ecosystem approach. • Conservation visions are not always commonly shared or understood. • Members of the public (and conservationists!) are often resistant to change. • Neither 'the public' nor 'farmers' are uniform groups, and communication needs to be carefully designed for different audiences.

Recommendations

- Produce clear guidelines and ‘rules of thumb’ to help conservation practitioners plan ecological networks and conservation landscapes. This should be based on the best scientific evidence and practical experience and cover multiple taxonomic groups and landscape/ecosystem types. Ideally it should also address different conservation objectives, practical considerations and social and cultural dimensions. It should be suitable for a diverse range of conservation partnerships and types of conservation project.

- Provide consistent advice and ongoing support to land managers and local conservation projects, based on clear science but in a language that is appropriate, with clear and consistent terminology. This should encourage more experimental design in management where appropriate, and the recording of outcomes.

- Take a more strategic and systematic approach to the planning of conservation at a national level. This should include developing a set of recommended priorities for each local area (e.g. counties or National Character Areas) across the country. This should be based on a Great Britain-scale analysis of priority areas, and identify which species (or habitats, features, services) are most important in each area (it won’t necessarily be the rarest species). This information will help people setting up local projects to decide what they should focus on conserving or restoring.

- Build popular support for large-scale habitat/landscape restoration through a televised national competition.

- Produce a web-based resource to record what projects/activities exist and where they are and ensure it is used widely across the conservation community.

- Continue research on important relevant topics such as landscape ecology and species movement across landscapes; management for multiple objectives; ecosystem services.

- Continue government engagement with and reporting on delivering successful large-scale conservation. Improve knowledge exchange and encourage ‘learning by doing’.

Case study: Restoring marsh fritillary metapopulations on Dartmoor and Exmoor

Jenny Placket, Caroline Bulman, Sam Ellis and Nigel Bourn; Butterfly Conservation

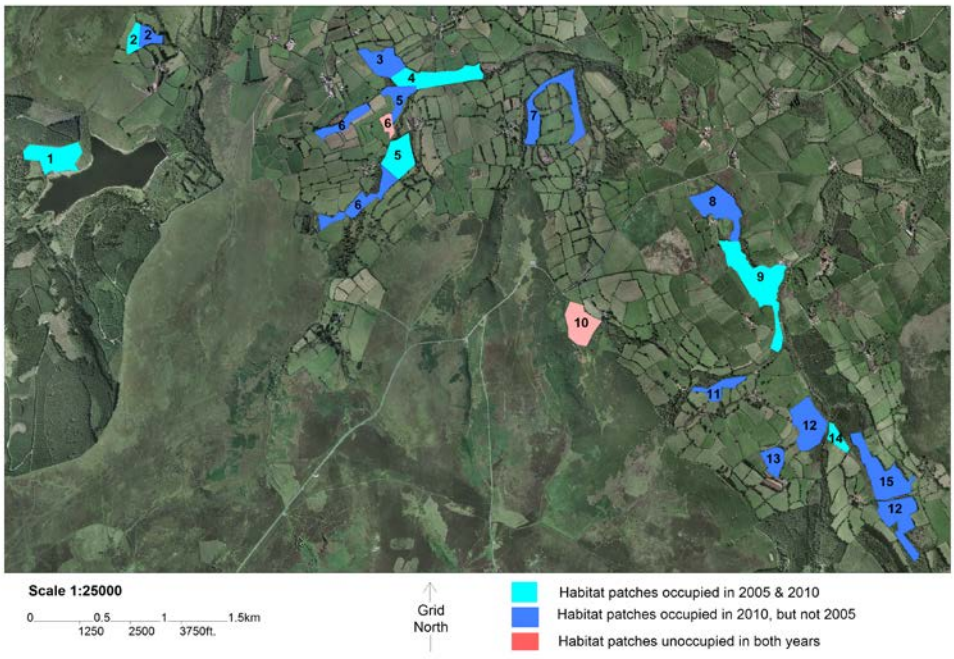
The science of metapopulation biology, often focused on Lepidoptera, has led to a greater understanding of how individuals move between habitat patches and how changes in patch size, quality and isolation affect Lepidoptera survival (Hanski 1998; Thomas and others 2001). As a result Butterfly Conservation has responded by shifting the majority of its conservation work from a focus on single sites to targeting networks of sites across a landscape. One such example is in the South West of England where Butterfly Conservation, Natural England, Dartmoor and Exmoor National Park Authorities, the Environment Agency and the local farming community have been working together through the Two Moors Threatened Butterfly project to improve ecological networks for the marsh fritillary butterfly in Dartmoor and Exmoor.

The marsh fritillary *Euphydryas aurinia* breeds in open grassy habitats and is linked to extensive pastoral farming. Marsh Fritillary populations function on a landscape-scale and persist where large networks of suitable habitat exist, with groups of local populations connected by occasional dispersal, often referred to as a metapopulation. The UK distribution of marsh fritillary has declined substantially due to loss of natural grassland associated with agricultural improvement, abandonment of grazing in some places and overgrazing in others. To achieve long-term population stability, the butterfly requires an extensive network of connected habitat patches where devil's-bit scabious *Succisa pratensis* is abundant. Research has shown that an area of between 80 ha and 142 ha per 1,600 ha (that is, 5-9% of a landscape) is required to achieve persistence within the landscape for 100 years, depending on the spatial location of the habitat (Bulman and others 2007). This work demonstrates that action to reverse the decline of marsh fritillary needs to be undertaken at a landscape scale.

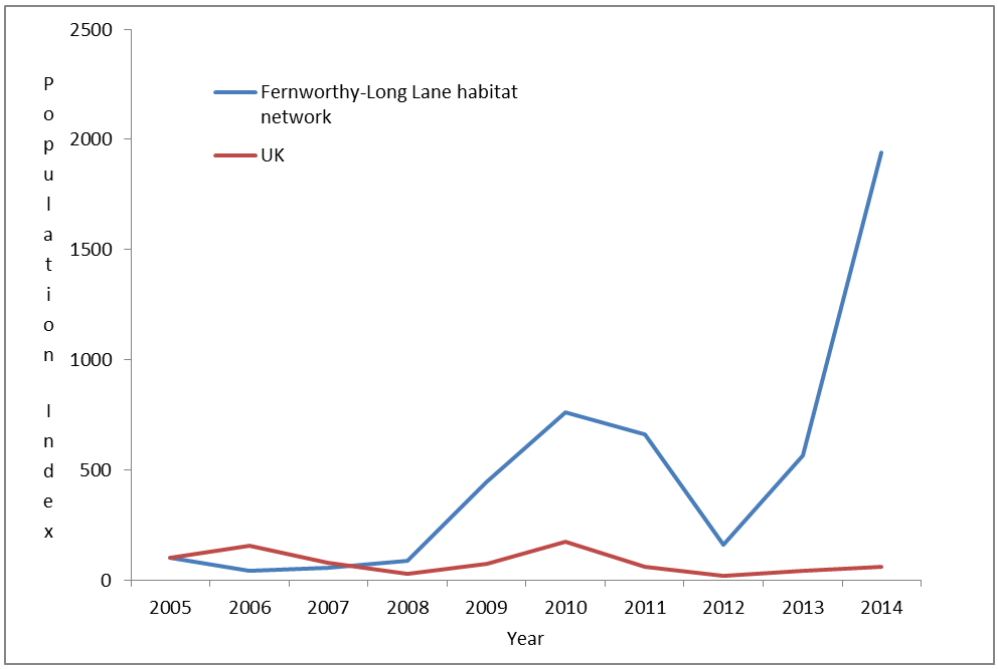
Marsh fritillary Photo: Allan Drewitt, Natural England

The Two Moors partnership project was set up to improve habitat networks for the marsh fritillary and other butterfly species across Dartmoor and Exmoor. Project staff work with landowners to encourage sensitive management, increase connectivity between sites and develop agri - environment agreements which include appropriate management prescriptions such as cattle or pony grazing and fencing works. Training sessions have been organised for conservation professionals, landowners and contractors and practical conservation measures including bracken management and transplanting of young devil's-bit scabious plants have been undertaken by volunteers.

As a result of the project, 71% of sites within Dartmoor's four habitat networks are managed for the marsh fritillary. This has increased the area and quality of habitat, as well as improved connectivity between patches. In the Fernworthy-Long Lane habitat network of wet grassland sites, the area of occupied habitat rose from 32.9 ha to 85.6 ha between 2005 and 2010. During this period habitat management was undertaken on 10 ha of land, including 8 ha scrub control, whilst nearly 5 km of fencing was erected or boundary work undertaken across 8 farm holdings to enable an appropriate grazing regime to take place. Managing habitat for Marsh Fritillary has also helped to maintain and restore habitat on a landscape scale for other declining Lepidoptera, e.g. the narrow-bordered bee hawk-moth *Hemaris tityus* and small pearl-bordered fritillary *Boloria selene*.



Map showing location of 15 farm holdings and changes in Marsh Fritillary patch occupancy 2005-10 in the Fernworthy-Long Lane habitat network



Marsh Fritillary larval web population trends for sites in the Fernworthy-Long Lane habitat network 2005-14, compared with the national trend over the same period

In addition to its strong foundation in scientific evidence, a number of practical factors contributed to the success of the project, including making use of agri-environment scheme funding, a significant input of volunteer time, regular ‘care and maintenance’ visits, and working in partnership.

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3. Partnerships within and among large-scale conservation initiatives

With the possible exception of some individual private estates and very large reserves, large-scale conservation always involves partnerships. Partnerships are different from simple 'stakeholder engagement': in a partnership, all parties are actively involved in a process from defining common objectives to implementing strategies.

A wide variety of different organisations can be involved, in a range of roles including (but not limited to):

- NGOs (particularly in direct conservation management, scientific advice, and monitoring);
- Government agencies/Non-Departmental Public Bodies (NDPBs) (particularly by providing scientific advice and funding);
- Government departments (particularly funding and scientific advice);
- Private landowners (particularly by providing land and carrying out conservation management;
- Private (e.g. utility) companies (particularly by providing funding and monitoring);
- Research institutes (particularly by providing scientific advice and monitoring); and
- Local community groups (e.g. to carry out voluntary work and contribute to plans).

As well as strong partnerships within individual conservation initiatives, there is a need for communication and coordination among partners involved in different conservation projects and schemes. Hundreds of large-scale conservation initiatives exist, in addition to many smaller reserves, and better coordination is needed. This is particularly important in those areas in which many initiatives exist in close proximity.

Important issues identified

Internal qualities of partnerships:

- Partnerships need a common vision if they are to accommodate diverse interests and priorities.
- Partnerships need the right partner organisations (and individuals from those organisations) with the right skills, knowledge and contacts to lead and engage others.
- Partnerships require open constructive relationships built on trust and honesty, open to each other's interests, based on good personal relationships, with mutual respect and acknowledgement of each other's strengths and goals.

Community engagement:

- An inclusive approach is needed to avoid obstacles at a later stage.

Sustainable funding:

- Sustainable funding is needed to enable partnerships to realise their potential and maintain momentum.

Supporting evidence:

- Lack of good environmental data and clear conservation priorities can hinder understanding of the necessary action to be taken by partnerships.

Some of the challenges and opportunities in addressing these issues

Opportunities	Challenges and constraints
• There is a growing awareness of the need to harness a wide range of skills and expertise, the need for effective teamwork; the need to share knowledge and achieve consensus; the need to innovate and think laterally and the benefits that can result; and of the opportunities for everyone to benefit. • Conservation organisations have a growing track record of working together; there are some excellent case studies to share. • Growing information about the work that various organisations are doing makes it easier to identify prospective partners. • There is growing awareness that partners need to share and consistently communicate the same vision for projects to be successful. • Resource constraints, and the scale of ambition within the conservation community, increase the incentive to collaborate and combine resources. • Partnerships are encouraged by funders. • There is an awareness that successful projects require charismatic individual leaders. • There is a lot of existing scientific evidence to inform and motivate practical action. • The new Countryside Stewardship will provide important funding for conservation management, continuing the important role of previous agri-environment schemes.	• Interpersonal or inter-organisational tensions can occur, including personality clashes, some partners being over-dominant and unwilling to take a back seat for fear of losing control, and poor understanding of each other's priorities. • Evidence to inform partnerships' priorities is limited for some topics; even when it does exist there is a lack of capacity to identify, obtain and analyse it. • Lack of funding to coordinate research/monitoring to set priorities for partnership projects (see other sections of the report). • Lack of resources (money and time) to build and maintain partnerships. • Partnerships are sometimes given low priority in organisation's plans and funding; representatives not having delegated authority to commit. • There is a lack of an over-arching vision; instead there is a multiplicity of overlapping separate visions, by multiple organisations whose agendas vary in breadth and timescale and use different terminology. • There is a lack of leadership in the nature conservation community to create and communicate this common vision. Competition between NGOs hampers progress. • People outside conservation sometimes lack trust in conservationists, and have a low understanding of the real value of nature.

Recommendations

- Establish a leadership group within the environmental sector to work towards better collaboration across the sector and to bring about national coherence in developing and communicating shared visions.

- Develop a strategy to bridge the gap with other sectors, particularly those who were previously thought of as barriers to conservation.

- In each project (and across groups of similar/geographically close projects), generate a shared vision with tangible successes for early wins. Get ‘can-do’ people on board who are at an appropriate level to make things happen. Ensure that the vision is co-created so that the solution is long-term, practical and valued by a diverse range of interests and addresses a diverse range of goals.

- Create a mechanism to join partners together in future projects, sharing knowledge and expertise. For example, list all potential partners and their projects, interests and available resources in a central, spatially-referenced database. This should go beyond the traditional conservation sector.

- Invest properly in the implementation stage of partnerships (time, funding and skills) to understand and value the partners objectives and motivations and develop clear goals supported by strong leadership.

- Improve understanding among the general public of the importance of nature, and inspire them to get involved (campaigning, conserving, learning, community projects). This could include twinning projects between schools and conservation areas.

- Nature conservation professionals should partner more with individuals and organisations who are experienced in community consultation and engagement work.

- Provide the right conditions and support (including up to date information) for charismatic and inspiring people who can catalyse and galvanise action, encourage participation in conservation, explain concepts using understandable language and help to facilitate and build networks of people working towards a common conservation vision.

Nature After Minerals – A case study of achieving biodiversity gain through partnership working

Carolyn Jewell; Nature After Minerals


Reedbed created at Langford Lowfields ©Ben Hall (rspb-images.com)

Recognising the potential for mineral site restoration to achieve significant biodiversity gains, in 2005, the RSPB undertook a research project to determine the potential contribution of mineral site restoration to achieving the UK BAP targets. The report (Davies 2006) found that 9 out of 11 key national UKBAP habitat targets could be achieved by restored mineral sites alone; however this potential was not being met due to certain barriers. Understanding the need to overcome these barriers, the RSPB and Natural England developed the Nature After Minerals (NAM) programme in 2007 with full support and backing from the two industry representatives, the Mineral Products Association and the British Aggregates Association.

The NAM partnership programme promotes strategic opportunities for delivering biodiversity through high quality habitat creation on mineral sites, and to communicate the benefits that high quality restoration can provide for people, wildlife and the economy.
In order to achieve the maximum biodiversity gain from minerals sites restoration, the NAM programme offers an advisory service to industry, planning authorities and landowners, drawing upon a wealth of knowledge, both in terms of ecological and planning expertise, from within the NGO / statutory agency partnership. Since the programme's inception in 2007, NAM has contributed to enhanced biodiversity-led restoration at 40 quarries, equating to approximately 3,250 ha of habitat.


Stakeholder workshop on planning mineral site restoration © NAM

Minerals extraction can result in either large quarries with the capacity to be extended or clusters of smaller quarries across the landscape, often associated with river valleys. Recognising the potential of these sites to contribute to landscape-scale conservation, NAM takes a two-pronged approach. First, it supports the industry to achieve the most through their restoration schemes and on-site habitat creation; and second, it works with mineral planning authorities to strengthen Mineral Plan[8] policies that encourage a net gain in biodiversity and promote a landscape scale approach. Through both approaches, NAM brings together a variety of stakeholders to align thoughts and ideas, e.g. ensuring that the environmental sector is consistent in its planning consultation responses, and bringing together different mineral operators quarrying in nearby locations to think how their site restoration plans can integrate and complement each other at a landscape scale.

NAM runs training and best-practice demonstration events, picking up on emerging and topical themes and providing a forum for discussion between operators, community representatives,

[8] A Mineral Plan sets out the planning authority's overall approach to future mineral provision, and is used to guide planning decisions about minerals development

planners and the environmental sector. Recent topics have included floodplain woodland creation, a habitat which, in the UK, is now restricted to small remnants; spatial planning and landscape-scale conservation; and through its involvement with the EU funded RESTORE project, a 43km flood alleviation scheme being realised through mineral extraction in the Netherlands: http://www.grensmaas.nl/.

The industry has the means and the imperative, the planning authorities provide the permissions and the environment sector has the knowledge to help ensure habitat restoration is carried out successfully on these sites. NAM's aim is to bring all of these together to create some special places, to aid the reversal of biodiversity loss, provide opportunities for people to get closer to nature, and to drive forward the economy.

Case Study 1: NAM facilitated joint working between the mineral operating company, RSPB, Natural England and Dorset County Council to engineer a connecting channel between Arne Clay pit and Poole Harbour, thereby creating a functioning saline lagoon with regulated tidal exchange. Early colonisers include amphipod, flounder, grey mullet, sand smelt, shore crab and wrasse. There are also frequent sightings of oystercatcher, little grebe, greenshank and kingfisher. The western edge of the lagoon adjoins an area of ancient woodland, which through a large volunteer gathering, has been planted up with acorns collected from the ancient woodland, and across the RSPB's Arne Reserve.

The opening of a connecting channel between Arne clay pit and Poole Harbour © NAM

Case Study 2: The valleys associated with the Trent and Tame rivers in the west Midlands (within the RSPB Trent and Tame Futurescape) contain nearly 4000ha of mineral sites. Mineral planning within this area is dealt with by six different minerals plans. Bringing together 31 representatives from 15 different organisations, NAM organised a workshop to provide a unique opportunity to promote and develop a strategic, landscape scale, cross-boundary approach to site restoration within this area.

Case Study 3: Through joint working with NAM, RSPB, Freshwater Habitats Trust and BSG Ecology, Hanson is creating a strategically-placed wetland restoration in Oxfordshire. The final stage of extraction at the site has now been restored to reedbed habitat rather than open water, following concerns about birdstrike from the local Oxford Airport and Ministry of Defence. Using the latest knowledge in reedbed design, the landforming of the beds includes provision of many small peninsulas and scalloping of the edges, and maximises the amount of interface between reedbed and open water. This creates an important ecotone where a high volume of species can thrive, providing aquatic habitat for fish and aquatic macrophtyes, emergent habitat for a variety of invertebrates, and suitable feeding habitat for birds such as bittern. A further area of the site has, in consultation with the Freshwater Habitats Trust, been landscaped to provide a series of small and shallow ponds. Further species-specific measures have been incorporated for kingfishers, otters and sand martins.

Constructing an otter holt at Cassington quarry, © NAM.

A series of ponds created as part of a restoration scheme at Cassington quarry, © NAM

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4. Land & funding

Ecological restoration, particularly at large scales, is a long-term process, requiring appropriate land management to be maintained over decades. Land availability and tenure arrangements, and sufficient funding to pay for the acquisition and/or continued management of land, interact to play a vital role in determining the long term success of large-scale conservation initiatives.

Private ownership of land predominates in many large-scale initiatives, but tenure is often a complicated mixture of private and public ownership, lease and management agreements. Some conservation initiatives involve a large number of land owners. Land availability/requirements influence project goals, site selection, decisions over whether to try to buy land or whether to work with the existing owners, and the size and type of partnerships. Funding is a crucial element in project sustainability and is typically a major concern for managers of large-scale conservation areas. Funding is vital for land purchase and management, but also needed for facilitation, coordination and communication, particularly in projects with large or complex groups of partners and stakeholders. Currently, grants from the Heritage Lottery Fund and from landfill funding, and funding for land management through agri-environment agreements, play a crucial role.

Important issues identified

- There is a lack of an overarching strategic vision underpinned by clear political support. In particular, there is a serious and growing discrepancy between short-term funding timescales and the long-term timescales required for effective conservation.
- Most projects face a huge challenge in trying to sustain momentum beyond their initial (usually short-term) funding and achieve a long-term legacy, caused by both problems in continuity of funding and the time it can take to achieve results on the ground.
- There is insufficient engagement with people potentially affected by large-scale conservation initiatives (beyond conservation organisations), leading to inaccurate and unnecessary perceptions of restrictive land designations or of productive land being ‘wasted’ or ‘locked up’.
- The UK seems less successful than other European Member States at accessing EU funds e.g. LIFE+, and competition for these funds will increase in future. There are insufficient national-level mechanisms to support development of proposals.
- Obtaining funding is generally a resource-intensive and bureaucratic exercise, and the development phase of projects is often insufficiently resourced to build the partnerships and proposals that are needed to secure effective funding for the project itself.

Challenges and opportunities in addressing these issues

Opportunities and positive forces	Challenges and constraints
• There is a high-level policy direction: the response to Lawton recommendations, Biodiversity 2020 strategy and NEWP have set a clear overall aspiration. • EU Landscape Convention, Birds and Habitats Directives and Green Infrastructure provide a further backing for large-scale conservation. • Growing research on benefits of large-scale conservation/restoration; e.g. jobs, health, tourism, social benefits. • Heritage Lottery Fund, Landfill funding and agri-environment schemes have provided a large amount of funding to large-scale conservation and will remain extremely important in the medium term. • There are opportunities for EU funding. • There are some good examples of projects benefitting from innovative and unusual funding sources whose lessons could be considered elsewhere. • There is a range of different approaches to land tenure across existing projects; lessons could be learned from this. • There is a growing level of ambition across the conservation community, and some examples of long-term thinking. • There is an opportunity to learn from countries that have been more ambitious, such as the Netherlands. • Urban projects could provide lessons in engaging with multiple landowners, particularly very large or very small organisations.	• The Rural Development Programme changes on a regular basis so its impacts may also change in ways that are unknown at the start of long-term projects. • Economic growth and cost-cutting is driving all agendas. • There are signs that timescales for government funding are becoming even shorter. • Consultation with local communities is hampered by limited time and resources available (particularly when needing to act immediately to take advantage of funding opportunities), by the difficulty of linking local values to landscape scale action, and sometimes by inappropriate consultation approaches. • There can be a lack of understanding and awareness of environmental issues in local communities, which takes time and resources to overcome. • There is an over-reliance on a few core funding sources (e.g. agri-environment schemes to pay for land management). • There is an over-emphasis on funding novelty, rather than maintaining past successes; but paradoxically it is also hard to obtain funding for systematically testing new approaches. • Many funding streams have restrictions on what they can be used for, and are inflexible to innovation and modification of project approaches. • Conservation bodies do not always appear sufficiently united and coordinated when presenting and communicating projects for funding and public support.

Recommendations

- Join up conservation 'brands' for a cohesive presentation of large-scale conservation to the public, to policy-makers, and to funding bodies.

- Set up a permanent fund to coordinate funding for large-scale conservation initiatives which would be independently administered and could support projects over the longer term.

- Continue to increase national-level support for EU funding bids.

- Provide more support (including financial support) for development stage of projects, including include time and resources to undertake early and meaningful consultation with local communities, e.g. through HLF development grants.

- Explore and use the full range of mechanisms for influencing land management (including rights, legal covenants, agri-environment schemes (and different approaches to those schemes, such as payment for results), land acquisition).

- Explore opportunities for diversifying the funding for large-scale conservation.

- Increase engagement with Local Enterprise Partnerships.

- Learn from projects that have taken unusual or innovative approaches to funding or land tenure/management arrangements.

- Encourage additional funding of large scale conservation projects through the benefits provided by associated ecosystem services.

Case study: The Heritage Lottery Fund's Landscape Partnerships programme

Lucy Hares; Heritage Lottery Fund

Since 2004 HLF's Landscape Partnerships (LP) programme has committed over £148m to 86 schemes across the UK. As one of the largest funders supporting landscape conservation initiatives on this scale, Landscape Partnerships have become a vital tool in protecting historic landscape character; fostering innovative approaches to land management whilst helping people reconnect to their landscape.

Under the LP programme, organisations can apply for grants from £100,000 to £3 million for schemes that deliver a range of individual projects, all helping to conserve the distinctive natural, built and cultural heritage of an area. Schemes usually cover a boundary of around 20 km^2 to 200 km^2, but can exceed this area if the applicant can justify working at a larger scale. Delivered via a partnership board that reflects national, regional and local interests, a Landscape Partnership also offers a unique opportunity to 'kick start' a transformation and behavioural change in a local area where the impact may last for decades. Legacy is increasingly important and building sustainability into a scheme is crucial. Likewise, HLF-funded schemes may draw in investment from a range of sources, and generate income streams beyond the length of the HLF grant.

Typically, a LP scheme involves a range of capital works and improvements to both the natural and built heritage, alongside community engagement, volunteering and the development of traditional skills. The aim is for local people – including landowners - to appreciate what makes their landscape special and valuable.

HLF sets a requirement for LP schemes to achieve nine programme outcomes, asking grantees to show the impact and benefits to both the physical landscape and for people living and working in the area. Two of the outcomes '*heritage is better managed'* and *'heritage will be in better condition'* can be measured comparatively easily, such as through improvements to water quality, increasing or improving existing habitats and/or encouraging more appropriate agricultural practices. The outcomes related to people and communities need greater consideration but can be measured by demonstrating how a community feels a greater responsibility towards caring for the landscape because they have developed an understanding of the distinct natural or cultural heritage of the area. HLF is also keen to see how an approach based on landscape character supports more resilient ecological networks.

The *Moors for the Future* LP scheme in the Peak District has approached landscape conservation on an ambitious scale, restoring 2,000 acres of degraded peat bog, involving 15 different partners. Likewise the *Windermere Reflections* LP aims to improve the water quality across the 235 km^2 catchment of the lake, returning it to a more natural and sustainable state with unpolluted waters supporting a range of aquatic life. LP schemes are not just delivered in designated or protected areas - five Landscape Partnership schemes overlap with Defra's Nature Improvement Areas in England, most recently funding the Humberhead Levels, and also supporting schemes bordering urban centres. The LP programme echoes the EU Landscape Convention that 'every landscape matters'.

Alongside the routine mentoring of LP schemes, to further support LP grantees HLF has recently launched an online community for schemes to share their experiences, success' and tackle challenges, alongside a range of other information available online[9].

Part of the area covered by the Windermere Reflections Landscape Partnership scheme

[9] The HLF LP programme guidance is available at
http://www.hlf.org.uk/looking-funding/our-grant-programmes/landscape-partnerships
You can sign up to the HLF LP online community here:
http://www.hlf.org.uk/our-community
More information about two Landscape Partnership schemes taking a landscape-scale approach to conservation can be found at:
http://www.moorsforthefuture.org.uk/ and http://www.windermere-reflections.org.uk/
CEPAR's evaluation of the Landscape Partnership programme carried out in 2011 is available at:
http://www.hlf.org.uk/aboutus/howwework/Documents/LandscapePartnerships_Summary2011.pdf

Summaries of plenary talks

Irthlingborough Lakes and Meadows is one of the Wildlife Trust's newest nature reserves in Northamptonshire. Sitting at the heart of the Upper Nene Valley Gravel Pits SSSI, SPA and Ramsar site within the Nene Valley Nature Improvement Area, it has strategic importance for wildlife. With funding from HLF and SITA Trust as well as Higher Level Stewardship, the site will be restored to its full potential, with significant involvement from the local community. John Abbott

The growth of large-scale conservation thinking

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Thinking Big

In the wake of the *Making Space for Nature* report (Lawton and others 2010) and the White Paper *The Natural Choice* (Defra 2011), the idea that conservation should be undertaken at a large scale, or over large areas, has taken a central position in conservation thinking in the UK (Macgregor and others 2012): the England Biodiversity Group urges conservationists to *Think Big* (England Biodiversity Group 2011). The set of Nature Improvement Areas announced in February 2012 (Defra 2012) is just one of a wider range of large-scale conservation initiatives being developed by a wide range of conservation organisations (Macgregor and others 2012).

The Natural Choice defines 'landscape scale' as: 'action that covers a large spatial scale, usually addressing a range of ecosystem processes, conservation objectives and land uses', and landscape scale conservation as 'the pursuit of multiple benefits across a defined area (e.g. water quality, biodiversity and access)'. It makes explicit links to the 'ecosystems approach': ' an integrated approach to land management, considering the costs and benefits of land use decisions, minimizing risks and maximizing opportunities for people, for nature and for the economy'.

Thinking Small

This interest in large-scale approaches is a considerable shift from previous thinking. For most of the twentieth century, nature conservation in England did not think big at all: it thought small. The tone was set as early as 1912, when the Society for the Promotion of Nature Reserves was established. Writing in the journal *Nature*, E.R. Lankester (1914, p. 33) urged all 'worshipers of uncontaminated nature' to support the society's attempt to secure 'the right to preserve from destruction in this country as much and as many as possible of the invaluable surviving haunts of nature'. Those haunts of nature, identified by Arthur Tansley in a list presented to the Board of Agriculture in 1915, were mostly small pieces of habitat, often the result of intensive management, 'precious living relics of the world as it was, before man destroyed it'.

When the UK government finally accepted a measure of responsibility for nature in the 1949 National Parks and Access to the Countryside Act, the Nature Conservancy developed a programme to protect such sites, either as National Nature Reserves or Sites of Special Scientific Interest. Not all were small (especially in the uplands), but many were. And to keep them in good condition, a whole armoury of techniques were developed, fencing, grazing, cutting, burning and managing everything from water tables to invasive species. English conservation's hallmark has long been thinking small: pocket-handkerchief sites, carefully chosen, fiercely protected and intensively managed (Adams 2003).

Changing Ideas

So what changed? Why large scale conservation in the second decade of the twenty first century? There is no simple answer to that question, but lots of obvious shifts in thinking, and new visions.

First, there have been developments in ecology, especially the development of island biogeography and understanding of its implications for nature reserves (isolation and extinction, and related developments in landscape ecology (the connections between fragments) and metapopulation theory (gene flows between patches).

Second, there has been a growing engagement in what the Nature Conservancy Council used to call the 'Wider Countryside'. Debates about the impacts of industrial agriculture in the 1970s and 1990s led to rapid growth and evolution in agri-environment Schemes from the Broadland Grazing Marsh Scheme onwards. Beetle banks and skylark plots represent at the very least a growing interest on the part of conservationists in what goes on the wider landscape.

Third, there has been a growing engagement with the relations between ordinary people and nature. This can be seen in the development of urban conservation (Bunny Teagle's 1978 publication *The Endless Village* was one landmark is what has become a mass movement). Now nature is regarded as a 'green gym', and the National Ecosystem Assessment (2011) tells us to see nature as provider of ecosystem services to the toiling masses (those who campaigned for national parks before the second world war would surely approve). Such concerns make ordinary wildlife in working landscapes important alongside the precious designated sites.

Fourth, the UK has looked outside its borders, especially to Europe where work has been going on for decades on ecological networks, the gaps between protected sites. The impacts of the Habitats Directive 1992 have been slow burn, profound: Natura 2000 is: 'an EU-wide network of nature protection areas … to assure the long-term survival of Europe's most valuable and threatened species and habitats; future management must be 'sustainable, ecologically, economically and socially' (http://ec.europa.eu/environment/nature/natura2000/).

Fifth, conservationists have started to think creatively, to move beyond trying to stop the loss of 'precious relics', and start to restore what is lost, and allow space for nature to recover and develop. Ecological restoration began with industrial sites, rivers, and forests, but has moved on. Jordan writes: 'at best, preservation can only hold on to what already exists. In a world of change we need more than that. Ultimately, we need a way not only of saving what we have but also of putting the pieces back together when something has been altered, damaged, or even destroyed' (Jordan, 1988). And those who propose restoration are bold in a way conservationists once were not. Large restoration projects have started to spring up, such as the National Trust's Wicken Vision, or the Wildlife Trust and Natural England Great Fen project. There are also large habitat creation projects, such as the RSPB's Lakenheath reserve. All these are within England's 'black hole', a block of midland counties with an unusually low coverage of SSSIs (Colston 1997).

Sixth, the interest in rewilding has contributed to the idea of the conservation of large areas of land. Peter Taylor's seminal book *Beyond Conservation* (2005) talked explicitly about rewilding large units of land, and many initiatives have continued that emphasis.

Last, but not least, the reality of human impacts on climate are being recognised as game-changers for conservation, in the UK as elsewhere. Protected areas are fixed in space and increasingly sit as isolated islands of habitat in highly industrialised landscapes, not well designed or located to allow species to move in response to climate change (Hannah and others 2007).

The Large Scale Conservation Movement

Of course, the conservation of large areas is not completely new, even in England. Royal hunting grounds, like the magnificent Richmond Park in southwest London, with 1000 ha of SSSI, has been managed for game at least since the days of King Edward in the thirteenth century. There is a bit of a jump between playgrounds of despotic aristocrats and contemporary bureaucratic conservation, but the idea of 'thinking big' without doubts has deep roots. The Huxley Committee's proposals for post-war conservation, before the 1949 Act, included provisions for 35 large 'Scientific Areas', 'tracts of country … worthy of preservation' but did not require management as a 'strictly controlled reserve' (Huxley 1947, para 206). In distribution and extent they bear an uncanny resemblance to the Nature Improvement Areas announced in 2012 (Adams and others 2014).

Perhaps the vision of conservation of nature over large areas has always been there, latent, and is only now being realised in practice. Certainly thinking big is currently exciting a lot of people, and attracting a lot of investment. New visions throw up new challenges and new possibilities.

The last World Parks Congress expressed a new challenge facing those concerned with protected areas: 'In the past they have been seen as islands of protection in an ocean of destruction. We need to learn to look on them as the building blocks of biodiversity in an ocean of sustainable human development, with their benefits extending far beyond their physical boundaries' (Steiner 2013, pp.). The fun part of the challenge ahead is dreaming on a large scale. The tough part will be making large conservation areas work.

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Large-scale biodiversity conservation in theory and application: better, bigger, more and joined

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A greater emphasis upon large-scale conservation (I generally here mean at a scale of c. 500 - 5,000 ha.) is one of the most significant recent developments in English conservation policy (e.g. Lawton 2010; Defra 2011). In large part this is a recognition of the effect of large scale 20th century habitat loss. This has resulted in not just a smaller total habitat area, but increased habitat fragmentation. As a result, over a large part of lowland England, especially in the Midlands, small, isolated and therefore more vulnerable sites account for a major part of the population of wildlife sites.

However the ecological principles which underlie the large scale approach remain contentious in the research community (e.g. Hodgson and others 2009, 2011, Doerr and others 2011). I believe to some degree this is inevitable. At larger scale the individual systems of study becomes greatly more complex and difficult to manipulate than at the scale of a few square metres, or small multiples of hectares; the scales at which experimental ecological research is usually conducted. This complexity also means that replication of experimental and even observational approaches is extremely difficult as large scale replicates cannot be easily created or found. Further, most research in this area is focussed upon one or a few species. No two landscapes are the same and no two species occupy the landscape with the same dynamics. The impact of this inter-specific variability can be seen in the widely varying rates at which southern species at the northern edge of their range have expanded ranges northwards and uphill in response to climate change (Hickling and others 2005, 2006). So the conclusions from one study are not necessarily comparable with another, and studies may even yield findings which are not generally applicable to conservation practice. It may be that at some future date these methodological problems are ingeniously overcome but currently they appear to me, fundamentally difficult.

A complication which should also not be overlooked is a lack of consistency in use of terminology, not least in the use of the term *connectivity*, which, e.g. clouds the debate between Hodgson and others (2009, 2011) and Doerr and others (2011). As discussed below Lindenmayer and Fischer (2007) suggest the situation might be clarified by defining three different meanings of the term connectivity, but this proposal seems unlikely to result in perfect clarity of communication, even if it were agreed their use of terms is appropriate.

In the light of the above, I believe a practical corollary of the large-scale approach is that it will not and cannot be implemented to give precise, predicted outcomes for all aspects of biodiversity but, if carried out successfully will improve the outcomes for very many aspects of biodiversity, including habitats, species and the ecosystem services they provide.

Despite the above, I also consider there are useful principles that can be applied to large scale conservation. The strapline of the Lawton report, *Making Space for Nature,* of "better, bigger, more and joined" (Lawton 2010) is a useful framework upon which to hang these principles. But please note that deliberately I have put the word "better" first, and deliberately chosen this word order. This word order is not consistently used in *Making Space for Nature* or other publications. However I chose this word order because I think it forms a logical sequence, and is of practical value as a "tick-list" to guide conservation decisions.

Better

It is a widely recognised principle of site-based conservation that a successful outcome involves maintaining specific qualities of the habitat. These vary between habitats and in some cases survival of rare species may require maintaining individual site features that the species requires, such as the presence of a food plant required by an invertebrate. For example: maintaining habitat quality often involves protection from, or control of, invasive native and non-native species; in woodlands it may involve maintaining structural diversity of the canopy; on heathlands and some grasslands the maintenance of bare open habitat essential for reproduction of many plants and animals is often desirable and in wetlands maintenance of site hydrological physical and chemical integrity is critical. As sites and the habitats within them are the building blocks of a large-scale approach, maintaining or improving the quality of these components should be the *sine qua non* of large-scale conservation practice and the first stage of a conservation plan. Indeed in the uplands and some lowland areas, such as the New Forest and Salisbury Plain, where habitat remains extensive the conservation issue is almost exclusively that of maintaining or restoring habitat quality.

A common feature of many ecological studies at landscape scale is that they include no data about how habitat patches vary in quality; at their worst they focus exclusively upon the geometry of habitats in the landscape (e.g. patch size and inter-patch distance) to the exclusion of patch ecology. Research on three British butterflies, Glanville fritillary *Melitaea cinxia*, Adonis blue *Polyommatus bellargus* and Lulworth skipper *Thymelicus acteon*, has shown that isolated habitat patches are far more likely to support these species if they contain a suite of the features the species require (i.e. they are high quality patches) (Thomas and others 2010). This undermines the frequent assumption that inter-patch distance and the properties of the matrix between the patches are the key determinants of species' landscape occupancy patterns.

The reasons for the important role of site quality are almost certainly biological. A population at a high quality site is likely to be larger and less-inbred (Saccheri and others 1998). It is therefore less prone to perturbation-induced extinction. It is also more likely to produce a surplus of offspring to disperse into the wider landscape. High quality sites are also more likely to be colonised with persistent populations which in turn produce an offspring surplus. Habitat quality is therefore critical to dispersal and meta-population dynamics in the landscape (Matthysen 2012). The failure of thermophilous species such as the scarce emerald damselfly *Lestes dryas* to expand their range in response to climate change (Hickling and others 2005) may not be due to the isolation of their populations but simply they hang on in sub-optimal sites where they cannot create a large enough surplus of offspring to expand their range.

Bigger

I would argue there are a number of reasons why, if creating new habitat is proposed, expanding existing sites should be considered before creating new ones.

A pragmatic reason for this is that the physical conditions for creation of a given habitat, notably suitable soils, are more likely to found next to an existing habitat patch.

For the great majority of species, the probability of dispersing to a new area decreases with distance from the parental locality (Cousens and others 2008; Nathan and others 2012). Therefore creating new habitat next to that which already exists is likely to greatly increase colonisation by a wide range of species.

Further, for those species which can colonise the new habitat of an expanded site (in practice it is unlikely to be the same as the existing habitat in the short term and possibly never exactly the same as current habitat) this is likely to result in a larger total population size than that found in the original habitat patch. For most species this population increase will increase long term persistence by buffering against effects of perturbation and in-breeding. There is indeed an imperative for expanding many relict habitat fragments of formerly larger sites. This is because whilst some species may have become extinct at the time of local habitat destruction others may linger on the remaining fragment as small populations which are no longer viable and gradually go extinct. After habitat destruction events, and potentially for many decades, small surviving habitat fragments may carry an "extinction debt" of those populations which cannot be sustained long term on resources within the relict fragment. This is a debt which will be paid in repeated local extinction events (Kuussaari 2009). For many small sites, therefore, simply maintaining a site at its current size will not deliver conservation of its current species diversity.

An additional consequence of small site size is that of having a greater length of boundary relative to area. A larger proportion of the site lies close to a boundary and is affected by what happens on the boundary. In woodlands, reducing site size is likely to result in changed microclimates, particularly drying out, possibly putting sensitive species at risk. A more significant risk in lowland England is the impact of agrochemicals spread on the site boundary. For example, Willi and others (2005) concluded that adverse nutrient enrichment effects on the flora due to use of fertilisers on adjoining land, extended 100m into ancient woodlands. Creating additional habitat, albeit habitat more likely to be damaged by activities outside the site, will therefore help to buffer the site against some of the adverse ecological impacts of adjoining areas.

A final reason for expanding existing sites is financial. Nearly all wildlife sites require some management. When costs per unit area are taken into account a higher proportion of this cost is likely to be incurred on small sites than big ones (Armsworth and others 2011). For example, it may be more or less the same cost to provide water to stock at a large grassland site as at a small one; because nearly always the boundary of a small site is larger per unit area than a small one, the unit costs of fencing will be greater; monitoring a small site may take less time but the travel time and costs to visit sites will be the same as a large site. Money is not everything in conservation decision making, but expanding existing wildlife sites rather than creating new ones is financially logical.

More

Making sites bigger involves creating more habitat. However, in the landscape as a whole, creating more habitat is likely to increase levels of species diversity. The search for universal principles in ecology like those found in physics has proved elusive, but one of the most robust is the *species area relationship (*Lawton 1999*).* A pattern repeatedly identified in nature is that as habitat area increases in a patch or landscape so does the number of species recorded, although this is not a simple linear relationship. Small increases to small habitat extents have a proportionately large effect but as the habitat area gets larger the addition of extra habitat results in fewer additional species. One can therefore expect that not only will making sites bigger very often increase species numbers at site and larger scales over time, increasing total habitat area in a landscape will have an additional effect. In other words adding habitat away from existing sites is also likely increase the number of species within a landscape.

The reasons for the species-area relationship have been much discussed and evolutionary and geographical factors play a part (see Rosenzweig 1996 for a fuller account). However, I think most

who have looked at the question would agree that increasing population carrying capacity and environmental heterogeneity are key ecological factors. Put simply, increasing area will mean many more species have resources available to support larger and therefore more resilient and persistent populations; whilst as habitat area increases so does typically the range of environmental conditions which means niches are available for more species.

This last point deserves more reflection in the conservation community. Most often targets for habitat restoration aim to create further areas of a set of "officially" sanctioned habitat types judged as important for a variety of features of conservation value. This includes habitats identified in the Guidelines for the Selection of Biological SSSIs (NCC 1988), Annex 1 of the EU Habitats Directive and the priority habitats identified in the UK Biodiversity Action Plan processes. However, there is significant evidence this list is not complete and, at a landscape scale, exclusive concentration upon these "official" habitats will not deliver the optimum diversity or even conserve what occurs today. For example, the biodiversity audit of all wild species in Breckland (Dolman and others 2010) found that significant numbers of nationally rare and local species occur only in disturbed, ungrazed habitats and mosaics of open habitat and scrub, a group of habitat types not recognised in the "official" conservation planning for Breckland. The situation is even more extreme in urban areas where a high proportion of the area supporting wildlife consists of habitat to which many conservation frameworks are blind, such as anthropogenic surfaces, including buildings themselves; spontaneous ruderal vegetation and vegetation in gardens and parks (Francis and Chadwick 2013). In addition there are, in both the town and countryside, new combinations of plant species not found spontaneously in nature such as seed mixtures being sown on farmland to support declining wildlife such as bees and birds, or in parks and other recreational areas to provide a wildlife experience for the general public. In theory increasing the amount of both the "official" and "unofficial" habitats is likely to create a higher level of biodiversity, but currently we lack a widely agreed full description of habitats for planning purposes and a body of evidence which demonstrates the significance many ‘unofficial’ habitats make to biodiversity conservation.

Joined

It is unusual for a discussion about large scale conservation to take place without frequent use of the word "connectivity". It is however a word for which its meaning has become subject to different interpretations, potentially leading to confusion. Linderman and Fisher (2007) have suggested it has three distinct meanings:

1. **habitat connectivity** – the connectedness of habitat patches for a given taxon.
2. **landscape connectivity** – the physical connectedness of patches of native vegetation cover as perceived by humans.
3. **ecological connectivity** – the connectedness of ecological processes such as hydrology and energy flow at multiple spatial scales.

I propose to side-step these issues and address the central biodiversity issue which relates to the ability of organisms to disperse in the landscape; that is to move, often inter-generationally, between resource patches. This is of course, a concern heightened by climate change which is causing a redistribution of climatically favourable resource patches and thus the species which occupy them in the landscape (e.g. Lawson and others 2013).

My understanding is that here I am writing about "habitat connectivity" in the sense of Lindermayer and Fischer (2007), who rightly recognise that this is a species-specific property. That is, not only do species vary in the resources they require, the way individual species disperse is extremely

variable. For example, plant seeds may be dispersed by water, air and many different animal vectors and this will influence the spatial pattern of dispersal in the landscape (Cousens 2008). Also the barriers to dispersal in the landscape may differentially filter species. For example, in one study in a fragmented landscape with near natural light regimes, diurnal butterfly dispersal appears far more limited than nocturnal moth dispersal (Daily & Ehrlich1996). I remain pessimistic that a single general landscape model or specific landscape parameters can be identified which are applicable to all species and there is single ideal landscape formulation at any locality, just as often choices about habitat management and distribution will favour one set of species over another.

Despite this I would like to suggest there are some useful principles which emerge from common features of dispersal amongst plants and animals.

Although not universal, a feature of dispersal already referred to above is that the majority of propagules travel only a short distance from their birth locality (Nathan and others 2012). Resource patches near to the parental locality are therefore statistically more likely to be colonised, so patch proximity will favour maintenance of a species at landscape-scale. It is important however to bear in mind that environmental features such as prevailing wind direction, may influence direction of dispersal, whilst barriers such as artificially lit areas or busy roads will act as a filter, blocking dispersal for some species but possibly facilitating dispersal by others. Further the number and quality of the individuals leaving the natal site will influence rates of patch colonisation. As a consequence the landscape scale dynamic of a species relies on large healthy populations producing a large surplus of offspring. Further, for the landscape scale dynamics of species to persist relies upon not only colonisation of new sites but also the establishment there of breeding populations. The presence of "better" habitat creating a surplus of offspring and habitat for new colonists is therefore critical to the operation of large scale species dynamics, and we have come full circle!

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People and landscape

Paul Selman
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This talk started with an *ad lib* in response to the previous speaker, who had questioned the notion of 'connectivity'. I replied that, in my view, 'connectivity' was, indeed, of questionable value if considered narrowly in relation to species conservation. However, when considered in a broader context, there was diverse evidence from many disciplines that disconnections amongst ecosystem services had contributed to numerous problems, hence the significance of measures aimed at retrieving nature-nature and nature-people linkages. Large-scale landscape proposals need to consider many aspects of people-landscape relationships, as well as other 'physical' relationships such as sustainable drainage and urban climates.

Indeed, if we want to produce genuine landscapes as opposed to extended nature reserves, this must be done in combination with society. Landscapes are profoundly social constructs – intimate combinations of nature and culture. Unless we achieve this blend, future landscapes will not evolve and gain a momentum and identity of their own.

Valuing and reinforcing connections between people and landscape can help to deliver improved ecosystem services, and to improve the likelihood that large-scale landscape proposals will be implemented and managed over the long-term. However, we should not think of 'people' in a simplistic way – they are not homogeneous. There are many ways in which different individuals and groups of people can be linked to landscape, varying according to their needs and interests.

Some of the ways in which individuals differ significantly is through:

- age – children, younger adults, elderly people will perceive and use green spaces differently, and children may grow up to be adversely affected by 'nature deficit'.
- physical ability – able-bodied and less-abled people will perceive and access different opportunities and affordances in the landscape.
- ethnicity – people of different heritage backgrounds will tend to differ in their preferences for design, enclosure, wildness, etc.
- fitness and health – walking, 'green gyms', 'special places', fresh air, and so forth, contribute to levels of physical and mental wellbeing in society.
- specialist interests – whilst society at large may connect with landscapes in general ways, some people have specialist interests, such as photography, which require specific landscape qualities.
- political and community involvement – some people may have a 'representative' role in society and seek specific types of landscape regeneration for the good of their community.
- urban/ rural – people's perception of, and attachment to, the landscape vary in fairly consistent ways according to the urbanity or rurality of their environment during their formative years, and this can influence their attitude to large-scale landscape proposals.

Equally, as well as individual influences, certain social groupings may display shared associations with landscapes. These include:

- neighbourhoods – relatively small and compact areas associated with 'doorstep' landscapes.
- communities of place – the traditional idea of a geographically compact, physical community, which may acquire part of its identity from a local, distinctive (although not necessarily beautiful) landscape.
- communities of interest – geographically dispersed groups sharing a common interest or membership, who may identify strongly with specific landscape assets, e.g. anglers, ornithologists, golfers.
- communities of practice – groups formed of people with common professional interests, such as farmers, highway engineers, etc.
- 'Friends of…' – groups which may form specifically in relation to an identifiable landscape, ranging from a local open space to a national park.

Some of these associations may constitute 'new expressions' in the maintenance of, and emotional attachment to, landscape – e.g. people attracted to a new housing estate because of the developer's landscape-oriented marketing, residents associations that are responsible for maintaining a landscaped site, or employees engaged in countryside volunteering through companies' corporate social responsibility programmes.

Landscapes, in turn, are just as varied as people. We must not have an 'identikit' image of what constitutes a 'valid' landscape, nor must we have a preconceived set of aims and objectives for large-scale landscape plans based on narrowly framed interests. Individual and group attachment will vary according to factors such as:

- special or ordinary landscape – whether the area is noted as a beauty spot or whether it is valued mainly because of its proximity and familiarity.
- urban/ rural/ urban fringe – landscape, or green infrastructure, will stretch right through built-up areas, through the relatively chaotic land uses around the edge of a city, into open countryside of varying levels of use-intensity and remoteness.
- beautiful or despoiled landscape – the current state of the landscape will affect the values that people attach to it, and how they want it to change in the future, and this may vary significantly between insiders (residents) and outsiders (visitors).
- connected or fragmented landscape – people tend to like a certain degree of heterogeneity (as opposed to incoherence) in landscapes, and so goals for people and nature may converge.
- scale – people often identify with relatively small scale landscapes and may find it difficult to comprehend larger ones, so that attitudes to large-scale proposals may usefully be influenced by considering them as accumulations of locally valued elements.
- characterful/ distinctive landscape – landscapes vary greatly in terms of their characteristics and what makes them different from other areas, something which is often appreciated subconsciously, and which may be reinforced through policy measures.
- associations – material traces of history, and nonmaterial traces of stories and memories, are often understood and valued, especially by 'insiders'.
- multifunctional landscape – many of the most important landscapes have multiple functions, and promoting these may be an important aspect of achieving long-term, spontaneous landscape evolution.

These qualities apply equally to existing and future landscapes. However, it is generally difficult for people to imagine future landscapes (especially large-scale ones) and people may even oppose landscape changes which they might have appreciated over the longer-term. This suggests a need to develop more imaginative landscape planning methods which include a learning process.

Broadly speaking, the values that individuals and groups attach to landscapes are:

- material values – such as food, natural resources, land values, economic values derived from landscape 'branding', recreational affordances, reduction in financial risks associated with 'resilient' landscapes.
- non-material values – such as beauty (both 'intrinsic' and 'acquired' aesthetics), wildlife, existence value, spiritual qualities, tranquillity, sense of belonging.

These are often only appreciated at a subconscious level by the public at large, but need to be recognised in landscape planning if future landscape proposals are to attract sustainable support.

In practice, people link to landscapes in numerous ways, and these must be factored into proposals for future large-scale landscapes if they are to 'work', i.e. if they are to be implemented, valued, maintained and celebrated. These ways include:

- leisure and recreation;
- health, wellbeing, restoration;
- active transport (walking, cycling, horse riding…);
- growing stuff (for nutrition, delight or raw materials); and
- education (from nature trails to forest schools, and special needs).

These uses are associated with phenomena such as:

- engagement in landscape management – willingness to spend time on doing things which sustain landscape features, from gardening to allotments, and from picking litter to conserving habitats.
- incidental/ subconscious use of the landscape, e.g. through specific transport routes and meeting places, which may result in something akin to 'hefting'.
- participation in landscape planning exercises, ranging from one-off consultation exercises to sustained programmes of social and institutional learning.

There is a very real sense in which the landscape – broadly conceived, and ranging from aesthetically pleasant local scenery to hazardous floodplain environments – can be instrumental in 'transformative learning'. Here, engagement in landscape-related study and practice can help to change the attitudes and behaviour of individuals and wider society towards sustainable lifestyles.

One of our greatest challenges is to change from a backward-looking approach to a forward-looking one: from historicity to futurity. This has already been addressed in wildlife conservation, where there has been a shift from preserving 'past nature' to creating ambient conditions for 'future nature'. Large-scale landscape planning has a strong tendency to be conservative, hankering back to a sanitised view of an erstwhile society that created organic villages and human-scale scenery. If large-scale landscapes are to be envisioned, endorsed, implemented, maintained and valued, we need to engage individuals and groups not only in design exercises but also in processes that involve imagination, learning and engagement. This has major implications for landscape

participation technologies, and for setting landscape quality objectives. At present, these have only been quite primitively developed.

Some of the implications are:

- a need to develop more imaginative participatory technologies.
- a need enhance “space for nature and place for people”.
- a need to link, and appreciate the validity of, all landscapes, from inner urban to remote rural.
- a need to promote the active engagement people in their places, whilst also recognising the importance of passive and subconscious engagement.

All of these have great significance in the ways we understand ‘connectivity’ and ‘connectedness’.

In sum, we need a greater sophistication in what we understand by the ‘people’ aspects of landscapes. Future-oriented large-scale landscape proposals will not succeed in the long-term unless they are informed by a sophisticated understanding of community and society. Thus, ecological networks will only succeed if they matter to people. Nature needs more space, and people need more place.

Paul Selman is an Emeritus Professor in the Department of Landscape at the University of Sheffield. His research focuses on rural cultural landscapes, and the values that derive from close associations between people and land. In particular, he is interested in issues of geographic scale in the study and planning of landscapes, and in the ways in which interconnections between people and landscapes can be reinforced.

Landscape-scale conservation: a view from the sharp end

Jemma Batten, Black Sheep Countryside Management
Project Manager, Marlborough Downs Nature Improvement Area

Background

I am an independent agri-environment consultant and the proprietor of Black Sheep Countryside Management. I have been working with farmers and land managers for almost fifteen years and have experience of all the various schemes that have come and gone in that time: Environmentally Sensitive Areas, Countryside Stewardship and, more recently, Environmental Stewardship.

As well as having been intimately involved in the design of hundreds of agreements, Black Sheep consultants also work with agreement holders to deliver the resulting on-the-ground agri-environment work. This ranges from preparing grazing management plans to working out where in-field arable options are going to be located from year to year; from organising fencing or other infrastructure works to any number of other activities. With this level of practical involvement it soon becomes clear that successful agreements are those where the scheme has been designed to fit the farm and that the opposite, trying to fit the farm to the scheme, rarely if ever works. Furthermore the best achievements are found where everyone on the farm is engaged, knows what they're trying to achieve, and understands their role in delivery.

As well as working directly for farmers, Black Sheep has undertaken a number of project development and research contracts for organisations such as Natural England, AONB partnerships, Local Authorities, Defence Estates (MoD) and others. We specialise in farmer liaison, often being contracted to engage those who manage land with local, regional and national priorities for landscape and conservation management. We involve farmers in project development and regularly work with groups of farmers on collaborative initiatives.

We have carried out detailed analyses of the effectiveness of agri-environment schemes in delivering local priorities, and contributed to the mid-term review of Environmental Stewardship. Our research indicates that, unless supported by specialists, many farmers will select the easiest options to fulfil scheme requirements and, with the best will in the world, follow the rules of the scheme without really having much of an idea what the underpinning objectives are or whether they're actually achieving anything positive. (And why should they? They're farmers, not conservation experts.)

Research undertaken in two very different protected landscapes – the Malvern Hills and Cranborne Chase and West Wiltshire Downs – showed that regardless of local landscape character and priorities the most popular elements of agri-environment agreements were hedgerow maintenance and low input grassland management. This is all very well in the Malvern Hills, where hedges and grassland are key landscape features. However, it's less positive in the arable landscape of Cranborne Chase and West Wiltshire Downs where in some areas over half of the Entry Level Stewardship budget is being used to deliver non-priority – hedgerow and grassland – management.

In 2010 Sir John Lawton and his team published *Making Space for Nature: A Review of England's Wildlife Sites and Ecological Networks*. The key message to come out of this report was "More, Bigger, Better and Joined" (Box 1) and it suggests that "in some areas the scale of what can be

delivered to enhance the network and the ensuing benefits for wildlife and people will be very high." These large areas were christened *Ecological Restoration Zones*.

This landscape scale concept was endorsed by Government with the launch of a competition to find partnerships to trial new ways to deliver conservation over large areas, now re-named Nature Improvement Areas (NIAs). While the conservation charities, quangos and landscape partnerships forged new alliances and rekindled lapsed ones, Teresa Dent, CEO of the Game and Wildlife Conservation Trust, decided it was time to galvanise farmers into action and so spoke to a group called 'Grasshoppers' during the summer of 2011. She encouraged them to think about joining forces with relevant partners to put together a bid for a proportion of the £7.5m to be shared between twelve NIA pilot projects.

Box 1. Ecological networks

The essence of what needs to be done to enhance the resilience and coherence of England's ecological network can be summarised in four words: more, bigger, better and joined. There are five key approaches which encompass these, and also take account of the land around the ecological network. We need to:

(i) Improve the quality of current sites by better habitat management.
(ii) Increase the size of current wildlife sites.
(iii) Enhance connections between, or join up, sites, either through physical corridors, or through 'stepping stones'.
(iv) Create new sites.
(v) Reduce the pressures on wildlife by improving the wider environment, including through buffering wildlife sites.

Making Space for Nature

One of those Grasshoppers, Chris Musgrave, took inspiration from this and brought it to me. Chris manages four estates on the Marlborough Downs and I have been the agri-environment consultant for these estates since 2006, working with Chris and his team to deliver Stewardship schemes across an area of almost 2,500 ha.

Chris and I have worked together since 2004 when we were both involved in the Downland Heritage Initiative (DHI) in the North Wessex Downs. The DHI grew out of the desire to "deliver an integrated land management project centred upon habitat expansion, sustainable farming, improvement to the setting of sites of cultural importance and improved informal recreation provision" (North Wessex Downs AONB Management Plan, 2004). Part of my work involved engaging farmers in the target area (see Figure 1) by a process of individual consultations and, more importantly, bringing them together to identify common goals, barriers and actions.

A line on a map

The NIA competition required two or more partners (from a list of 'approved' groups) to submit proposals for a landscape scale conservation project covering between 10,000 and 50,000 hectares (25,000 to 125,000 acres). The first thing Chris and I did was to try and work out what 10,000 ha up on the Downs looked like. We started with the original DHI target area (see Figure 1) which covers 23,240 ha and seemed a bit daunting for just the two of us. At 2,500 ha, the land we

already managed was too small to qualify so we needed something in between. Looking at the map we identified the surrounding farmers, many of whom are Black Sheep clients. Using the main roads as boundaries we drew a line on the map and came up with 10,370 ha – the Marlborough Downs Nature Improvement Area was conceived.

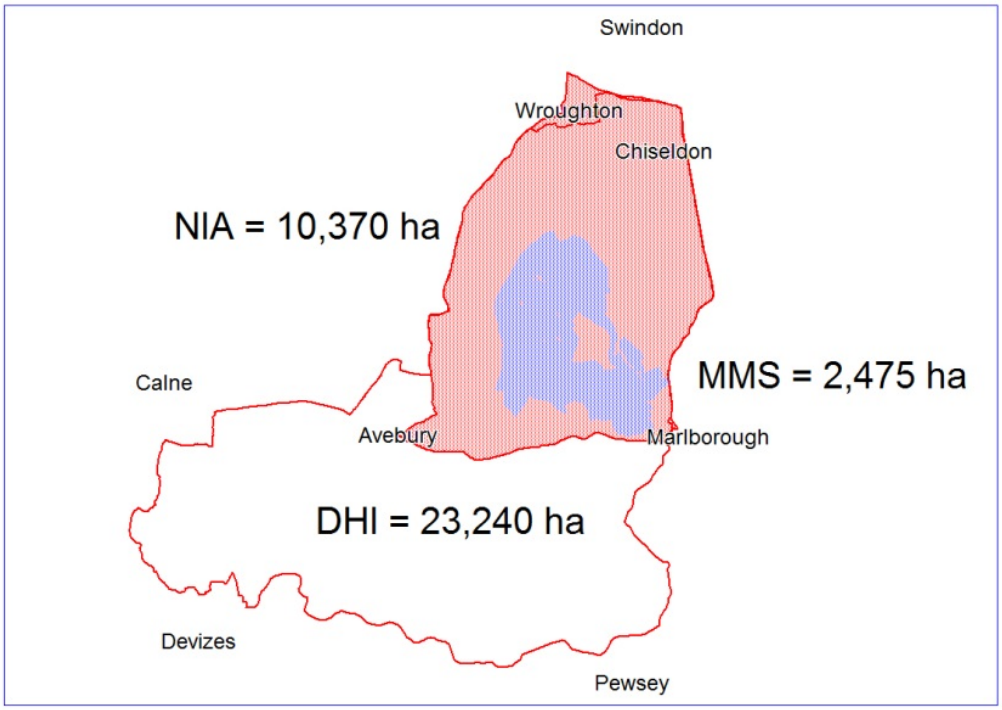

Figure 1. Downland Heritage Initiative target area (red boundary); land managed by Chris Musgrave with support from Black Sheep (blue); Marlborough Downs Nature Improvement Area (pink)

When we looked in more detail we found that our fledgling NIA included a number of important features: 34 Wildlife Sites (local and national); a World Heritage Site; a National Trail; a National and a Local Nature Reserve. The area is also a recognised hotspot for farmland birds and arable flora.

Designing a project from the bottom up

Chris's initial inspiration was the work that he had been involved with on Temple Farm, one of the estates he manages. The owner, Count Konrad Goess-Saurau, has spent almost 25 years transforming an arable prairie into a wildlife haven by planting trees and hedges, creating corridors of rough grass and scrub, building dewponds, experimenting with game cover crops, and practising extensive grassland management.

Having worked with a number of the other farmers in our potential NIA, I was aware that they were doing good things on their farms too, though all in relative isolation with little consideration to what their neighbours were up to. We felt that if all the farmers on the Downs could work together and co-ordinate their conservation activities we could create something very special.

In order to ensure that we were fully cognisant of local, regional and national priorities for the area and that our project could be seen to have a strategic overview, I consulted widely. I spoke to representatives from Natural England, various conservation and landscape agencies and charities, Local Authority specialists, community groups and all sorts of others until I had a huge list of

aspirations for the project. Obviously the time had come to hold a stakeholder meeting in order to identify objectives and set targets. And it was at this point that I had an epiphany as it suddenly struck me very forcibly that in this case the stakeholders weren't the usual suspects (i.e. all those I'd already consulted), but the **FARMERS**.

Individual aspirations – bottom up

I had identified 42 land holdings within the project area and sent invitations to all. Around 25 farmers turned up to a meeting in a barn on a bleak night up on the Downs and Chris and I presented our ideas. The whole concept, we stressed, was that for the first time farmers wouldn't be competing to get hold of a share of a grant, but would be partners with a budget working together to deliver best value for wildlife and community.

I had put together a list of all the various aspirations I had gathered during the consultation process (almost 40 in total) and, once it was clear that the NIA concept had support, I asked each farmer what they would be prepared to do on their farm – a simple Yes/No/Maybe for each item on the list. From the responses I identified six objectives and set targets based on the expected uptake of each activity. I wrote a detailed Business Plan, we identified GWCT and our local authority, Wiltshire Council, as our partners and were thrilled when the judging panel liked our idea and our application was successful. Thus the Marlborough Downs Nature Improvement Area was born.

The Marlborough Downs NIA project

We have been accused, somewhat derogatively, of being a 'targeted agri-environment' scheme which, to a degree, is true. We work in agri-environment, we have relevant experience and skills and we know that agri-environment scheme activities deliver real benefits, so why wouldn't we include elements of existing schemes in our project? However, we are much more than a derivative of an existing initiative.

Many farmers don't want to commit to long term agreements including activities with which they are unfamiliar and aren't sure will work. We give people the option to 'try before you buy', supporting even small scale delivery on individual farms (which, over 42 farms covering 10,000 ha, all adds up). In this way, we hope that these farmers will find that activities such as providing unharvested seed crops to feed farmland birds over winter isn't as difficult as they might have thought and will be encouraged to take up a larger area, or join a longer term scheme. More importantly, we truly believe that when people see the benefits of these activities – the birds, the wildflowers, the joy that nature gives to so many – they will be inspired to do more and get further involved. And we see this happening more and more as the project goes on.

Because we're not tied into any rigid set of scheme rules we can be a little experimental and try new ways to achieve established objectives. We can identify 'gaps' and support local priorities that are not considered sufficiently important to be supported via national schemes. Funding and expertise to build and restore dewponds, which have become something of a mascot for the Marlborough Downs, is one example of this.

We also believe that by working together we can learn from one another and benefit from everyone's experience. We see the project as something of an ecological brokerage, not only connecting farmers to other farmers but also to local specialists, surveyors, contractors, and to the wider community who live and work in and around the area.

We are a three year pilot project with a budget of just over £0.5m. We have neither the resources nor the time to facilitate long term ecological change, but we believe we can start the process and hand the baton over to conventional agri-environment schemes once we've done so.

The importance of ownership

In trying to understand why this project works it's important to recognise the immeasurable value of ownership, the difference between financial incentive and genuine motivation. Because the Marlborough Downs project is farmer owned and farmer led those involved have, before they actually deliver anything on the ground, made an investment. Investment leads to commitment and, with any group of people active in the same industry, an element of competition. This combination results in a connection with the project that goes far deeper than any financial gain it might represent, which bodes well for its sustainability. The key contributor to the success of the project lies in the relationships that continue to develop, not just between the farmers but relationships with the local community, with wildlife specialists and with the very landscape and wildlife of the Downs.

In order to nurture these relationships, to allow everyone to be involved in decision-making and to share delivery, the project has four Delivery Groups responsible for Wildlife Sites, Downland Species, Community and Outreach, and Access. Each group has between four and six members who are a combination of farmers, volunteers and specialists. The Delivery Groups support the project management team who in turn report to the farmer board. GWCT and Wiltshire Council are present to support the project rather than to drive it and have been invaluable in helping us to negotiate our first year.

And the past year has indeed been a roller coaster experience. We are a group of highly independent largely self-employed individuals used to making rapid decisions without consulting anyone else who have had to find a way to work together to set up a brand new organisation, charity, partnership and project. Because we're funded by the public purse we are required to abide by complex and often totally alien procedures. Before we could do anything on the ground we had to prepare detailed policies on everything from procurement to data protection, as well as working out what kind of insurance we needed, setting up a bank account (which took three months) and grappling with the development of the 'national monitoring and evaluation framework.' Not to mention that we as individuals had to personally bank roll the project for the first quarter until we could persuade Natural England that unlike other more conventional partnerships we don't have a pot of money upon which we can draw, and that what we need is regular advances rather than having to claim in arrears.

The administrative burden and reporting process has at times seemed crushing and we would have benefited from a lot more support in this area, as well as an initial three month 'setting up' period to concentrate on getting systems and procedures in place before having to think about delivering objectives.

However, it is clear that so far the project has been a huge success. The enthusiasm with which it has been received is overwhelming, with people from all walks of life and background getting involved. We've built ponds, planted bird mixes and tree sparrow 'villages', organised farm walks and given talks. Nest boxes have gone up, sites have been surveyed, and favourite walks and rides identified for promotion. Full details of our many achievements can be found by visiting our website www.mdnia.org.uk.

Conclusion

In *Making Space for Nature*, Sir John Lawton called for “a step-change in our approach to wildlife conservation, from trying to hang on to what we have, to one of large-scale habitat restoration and recreation.” While we in the Marlborough Downs are not naïve enough to think that in just three years there will be any real evidence of species or habitat recovery due to the efforts of our project, we do strongly believe that we are already achieving what Sir John aspired to: a step-change in attitude towards wildlife, landscape and our duty of stewardship, leading to very real changes in behaviour and co-operative approaches to conservation.

Jemma Batten has been involved in large-scale conservation as an independent consultant for twelve years. As well as working with individual farmers and landowners applying for and delivering Stewardship agreements, she has carried out research for various AONBs into the effectiveness of these schemes in supporting protected landscapes. From 2005 to 2008 Jemma was also responsible for developing an agri-environment scheme for Jersey. In 2011 she submitted a successful bid for Nature Improvement Area status on behalf of the farmers of the Marlborough Downs and has spent the past three years managing this project alongside her growing consultancy business.

Installing a nest box in the Marlborough Downs NIA. Photo: Nick Upton

Large-scale conservation in England, Scotland and Wales

Nicholas Macgregor
Natural England

In recent years, conservationists across Great Britain have increasingly been thinking at large scales. This is a response to, among other things: the problem of small, often tiny, nature reserves and the fragmentation of semi-natural areas; climate change and an expected need for increased movement by species across landscapes; the need to engage people in conservation and their local landscapes; a growing emphasis on ecosystem services and awareness of the large scales at which some of them need to be managed; and the benefits of integrating conservation objectives and resources. It's an idea that has really been picked up in conservation policy, reflected in a range of buzzwords in conservation literature, including 'landscape-scale conservation', 'ecological networks', 'green networks', 'connectivity conservation', 'resilient landscapes', 'catchment management' and 'an integrated landscape-scale approach'.

It is a theme that runs strongly through the series of new conservation policy documents and initiatives that have been published and launched in recent years, from the publication of Making Space for Nature in late 2010, through the National Ecosystem Assessment, Natural Environment White Paper and Biodiversity 2020 conservation strategy, to the launch of the Nature Improvement Areas in early 2012. But these reports didn't invent the concept of large-scale conservation; they synthesised and articulated ideas that had been developing in the conservation community for some time. Nature Improvement Areas are justifiably seen as flagship projects that have great promise for the future (depending on continued funding), but they are just the latest in a series of conservation initiatives established in recent decades, and many of those earlier projects are still under way.

So in 2010, around the time that Making Space for Nature report was about to be published, we decided it would be a good idea to see what lessons could be learned from all the past and existing large-scale conservation areas and projects. This led to what has become quite a long-running line of research with various sub-projects involving staff from Natural England, Atkins, the University of Southampton, the University of Cambridge and more recently the Durrell Institute for Conservation and Ecology. This talk focused on work done in a project between Natural England, Southampton and Cambridge, which had the following broad aims:

I. To get a better overview of the large-scale conservation initiatives across Britain.
II. To explore the approaches being taken, looking both at the conservation science used in site selection, objectives and management and at social and institutional factors such as partnerships, community engagement, securing funding, governance etc.
III. To investigate the environmental outcomes that large-scale conservation initiatives have achieved.

We investigated these questions using a range of approaches, including compiling a large database of information about as many conservation projects as we could identify, using questionnaires and interviews to gather information from project managers, and a range of spatial analyses. We were aware that different people and organisations talk about a range of things when referring to 'large/landscape-scale conservation', so rather than imposing a strict a priori definition, the scope of the research project was deliberately broad and inclusive: we included any conservation initiative that was over 10km^2, had goals relating to environmental conservation, and involved physical management on the ground.

Types, numbers and locations of conservation initiatives

Our first, perhaps most important, conclusion, was that there are many different existing initiatives, illustrating many variations on the theme of large-scale conservation. These range from very targeted projects focusing on enhancing meta-populations of individual target species (as exemplified in many Butterfly Conservation projects) through to things like target areas for Higher Level Stewardship which, while certainly involving practical conservation, are on the borderline of what could be considered an individual 'project'. In between there is a huge range of things, including Living Landscapes and Futurescapes, Integrated Biodiversity Delivery Areas and Nature Improvement Areas, individual habitat restoration projects, river restoration and flood management projects, ecosystem approach pilot areas, rewilding on single estates or groups of adjacent holdings, large nature reserves, community forests, landscape partnerships, and grazing projects. These all met our definition of 'large-scale conservation', they all feature on one or other organisation's list of their 'landscape-scale' projects, yet they are very different. There are various ways of categorising them, at least in theory, but the most obvious different groups relate to land ownership: there is a clear difference between i) initiatives that involve a single land owner or group of landowners that are all actively engaged in the conservation project; ii) target areas for grant schemes; and iii) conservation being done across many different private land holdings under the coordination of one or more conservation organisations.

We identified around 800 active projects of at least 10 km^2 across England, Scotland and Wales. The largest proportion of these is in England. Looking across the country, there are some obvious 'hotspots' of activity, such as the Fens and the Cumbrian Fells (Figure 1). There seems to be more large-scale conservation activity in National Character Areas that have more protected areas, are important for measures of biodiversity, such as NERC Act Section 41 mammals, and have seen improvements in landscape character in recent years.

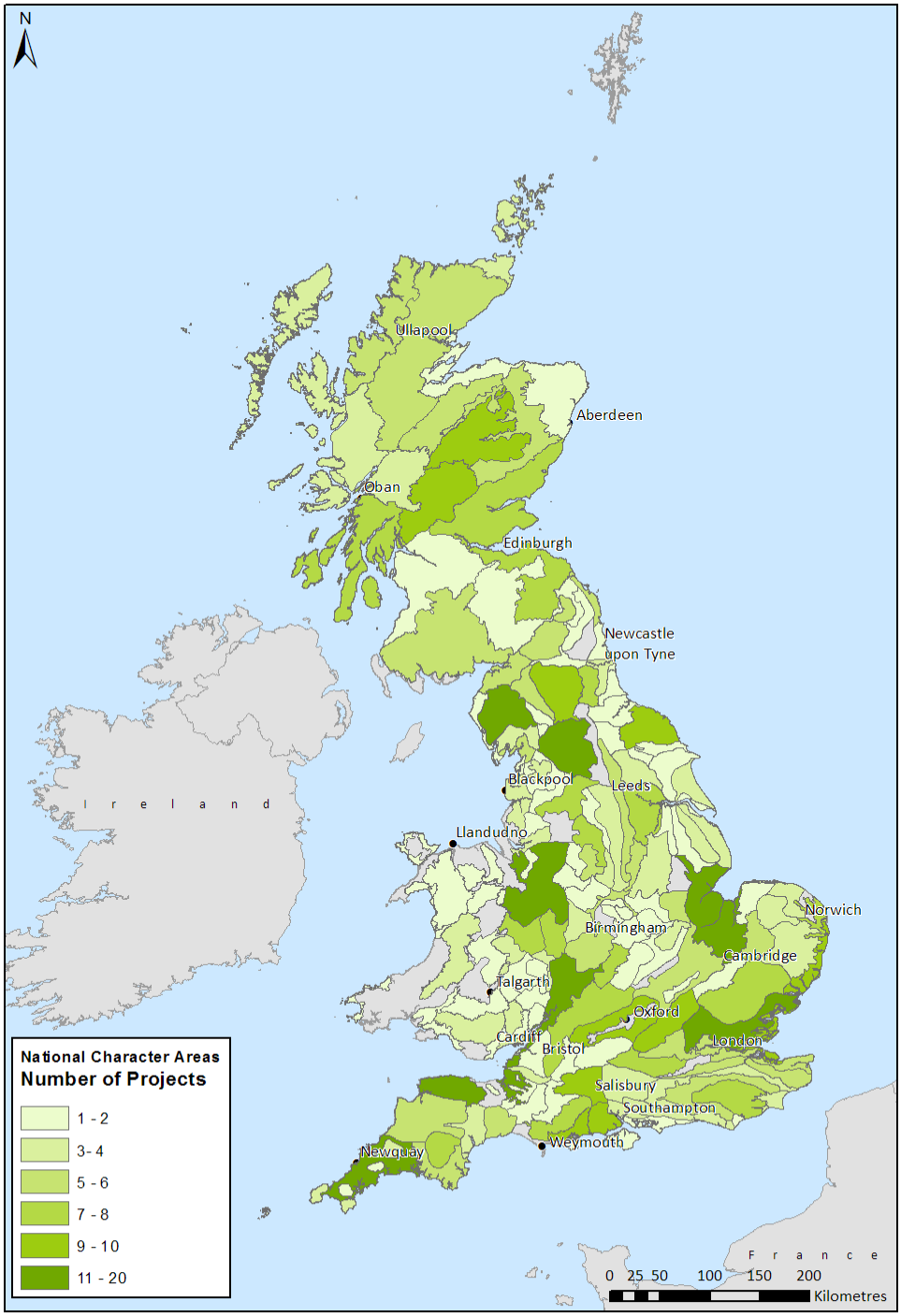

Figure 1. Patterns of large-scale conservation activity across Great Britain. National Character Areas (NCAs) are colour-coded according to the number of conservation initiatives. (This is an approximation, as each initiative has been assigned to a single NCA, whereas in reality some overlap multiple NCAs.)

In some of the more 'popular' areas of the country, the picture on the ground looks complex. For example, the Nene Valley Nature Improvement Area overlaps a Living Landscape, a Futurescape, a Strategic River Restoration area, and various HLS target areas, as well as smaller designated sites. In this case the NIA grew out of the combined efforts of those earlier initiatives, but it illustrates the need for coordination among different conservation organisations.

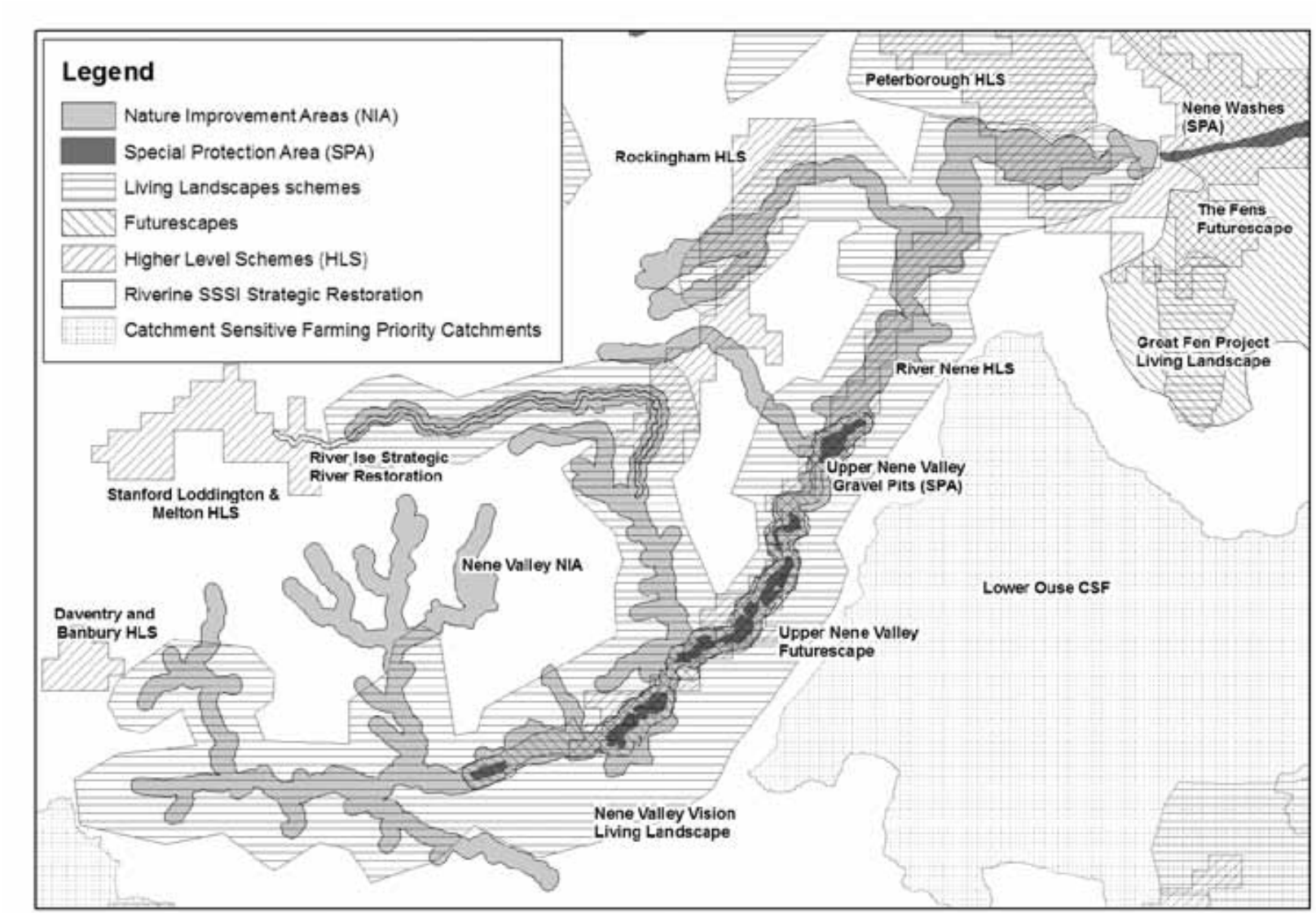

Figure 2. The coordination challenge as exemplified by the Nene Valley. The map shows the boundary of the Nature Improvement Area and the conservation areas that already existed in or near the new NIA when it was established. (The boundary of the Wildlife Trust's Living Landscape has since been adjusted to match the NIA boundary).

Planning and management

Planning, setting up and managing a large-scale conservation initiative is a complex business. Operating at a large scale and with (often) a wider range of objectives than a smaller nature reserve brings both opportunities and challenges. We identified four main sets of factors that appear to determine the approach that managers of different projects take:

- Conservation and other goals (influenced by the interests and priorities of the founding partners, the conservation philosophy (e.g. whether focused on species or wider ecosystems; whether setting specific targets or aiming for more open-ended restoration), and scientific knowledge and information.

- Land requirements to achieve those goals, preferences for different land management and tenure arrangements, and the availability of land under suitable management/tenure (influenced by ecological data, existing sites owned or managed by the conservation organisations, and by local land use and attitudes of landowners). Different projects take different approaches, including:
    - conservation work on partners' existing land;
    - trying to expand the area under ownership; and
    - working with other land owners without land acquisition.

- Partnership options: Most initiatives involve partnerships. Partnership arrangements and sizes vary and a wide range of organisations – government bodies, NGOs, landowners, private companies, research institutes, community groups and others – can be involved, in a variety of roles. (Partnerships are influenced by a need or opportunity to expand goals and scope, by local land use and ownership, by the presence of research groups with an interest in the topic or local area, by the presence of existing conservation projects or designated areas, and the availability of potential new partners with useful funding sources, stakeholder links, interests, etc.).

- Funding required and funding sources available: Funding is critically important, and maintaining it over the required time to achieve tangible environmental outcomes is a challenge for almost every project. A range of sources is used but especially grants for land purchase and agri-environment payments for conservation management. Funding arrangements can be influenced by: internal and external sources available; funders' requirements for particular management, targets and/or reporting; what activities funding will cover; places funding will cover; length of funding cycles.

There can be quite a complex interaction among these factors; an opportunity, constraint or increase in any one of them can affect all the others. For example, the end of a funding grant can force a narrowing of goals, while requirements attached to a particular grant might influence the activities carried out. New partners joining the project can cause the scope to change. Constraints on land availability might force a re-assessment of goals and activities, or lead to a search for additional partners, and so on.

Conservation outcomes

It is clear that many individual projects have achieved great success in restoring semi-natural vegetation, and in some cases there is good evidence of resulting improvements in species populations. There are also some fascinating examples of the scale and ambition of some of these

projects leading to new approaches that extend and in some cases challenge conventional ways of doing conservation. But unfortunately this has not yet translated to a detectable wide-scale improvement in the natural environment. Using data from the Countryside Survey, we found that areas of the country with high levels of large-scale conservation activity appear to have had greater improvements in water quality and woodland regeneration, but there is no real evidence for increases in species populations. To a large extent, this is the result of gaps in data – we often don't have enough information to compare 'before' and 'after' in conservation areas with appropriate control areas. It might also reflect the age of the conservation areas – most large-scale conservation projects were started after 2000; ten years might not be enough for some project-level environmental gains to be visible in a national-level analysis.

Final thoughts

We knew before we started this research that there was a lot going on in this area of conservation, but the results were still surprising – there are a huge number of projects, illustrating a very high level of enthusiasm and ambition in the conservation sector and an obvious desire to achieve environmental gains rather than just slow the losses. There is a lot of great work being done, with some promising results and clearly the potential to achieve a lot more. But it is very important to note that this is a long-term process. It needs long-term planning, land management and resourcing, over timescales much longer than a current typical grant cycle or agri-environment agreement, and needs to be supported by ongoing monitoring, evaluation and research. The conservation community needs to work together to get all these things in place.

Nicholas Macgregor is principal specialist in landscape ecology at Natural England. He is an ecologist whose work focuses on evidence to inform conservation strategies, with a focus on ecological networks, systematic conservation planning, and adaptation to climate change.

Organisations represented at the conference

Aggregate Industries

Atkins

Bat Conservation Trust

Bournemouth University

Buglife

Bumblebee Conservation

Butterfly Conservation

Centre for Ecology & Hydrology

Country Land and Business Association

Clearer Thinking

Clinton Devon Estates

Countryside and Community Research Institute

Countryside Council for Wales

CPRE

Cranborne Chase AONB

Cumbria Wildlife Trust

Department for Environment, Food and Rural Affairs

Durrell Institute of Conservation and Ecology, University of Kent

Environment Agency

Exeter University

Forest Research

Forestry Commission

Game and Wildlife Conservation Trust

Gloucestershire Wildlife Trust

Hampshire & Isle of Wight Wildlife Trust

Heritage Lottery Fund

Highways Agency

John Muir Trust

Kent County Council

Kent Wildlife Trust

Marlborough Downs NIA

National Association of AONBs

The National Forest Company

National Trust

Natural England

Nature After Minerals

National Farmers' Union

Norfolk Wildlife Trust

Plantlife

Reading University

RSPB

Scottish Natural Heritage

SITA Trust

South Downs National Park Authority

South West Water

Surrey Wildlife Trust

University of Cambridge

University of Sheffield

University of Southampton

University of York

Wildfowl and Wetlands Trust

Wildland Research Institute, University of Leeds

Wildlife and Countryside Link

The Wildlife Trusts

Wiltshire Wildlife Trust

Woodland Trust

WREN