



for birds
for people
for ever

FUTURESCAPES

**large-scale habitat restoration
for wildlife and people**



Citation

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Photo by C H Gomersall



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Foreword

I was born in Sheffield, surrounded by steelworks and railway shunting yards. When I was four, we moved to a village two miles out of town, just at the time when field upon field was being buried under endless estates of post-war housing. But even in my teens I could still walk out into farmland and hear skylarks singing overhead, find lapwing nests among the stubble and wade through hay meadows in the company of butterflies.

In the 40 years since then, there have been quite spectacular changes. Ironically, the post-industrial inner city is far greener than it was when I was young. Nature has healed the scars of heavy industry and much of the derelict land is wild and wooded once again. The urban rivers are less polluted than they've been for years – the kingfishers are testament to that – and all those millions of suburban gardens have matured into a rich mosaic of flower borders, ponds and shrubberies: an ideal habitat for songbirds, butterflies and frogs.

Sadly, the story in the wider countryside is very different. Half the ancient bluebell woods that were still there when I was born have since been lost forever. Most of the wilder wetland habitat has now been drained and the meadows have lost their wild flowers and their butterflies. From heather-covered hills to coastal saltmarsh, and in most of the rural landscape in between, we have lost wildlife habitat on a quite disastrous scale.

There is very little point in harking back to landscapes lost, however fond the memories might be. This is a new millennium – a time for taking positive steps to make amends. Although we may have lost much of the nation's wildlife in the past half-century, the good news is that we **can** bring it back.

Most of the post-war conservation effort has been focused on the need to save the few surviving fragments of the past. Quite understandable! However, at the same time, the RSPB and others have been working hard to re-create lost landscapes and to make new homes for wildlife. Now, much of that experience has been brought together in this exciting publication.

Futurescapes is the RSPB's vision for a thriving countryside – their blueprint for an ambitious, but achievable programme of extensive habitat re-creation. These case studies are living proof that it is possible to bring back Britain's wildlife. There are examples here of almost every kind of UK wildlife habitat: heather moorland, broadleaved woodland, lowland bog, reedbed, coastal saltmarsh – the list is long and impressive.

The need for a *root and branch* review of Britain's countryside is high on everyone's agenda. By working with nature we can help to secure a more sustainable future – a healthy landscape where wetlands cope with floods, where woodlands help to clean the air and stabilise the soil, and where, in just a few short years from now, another generation of the nation's children can grow up to the sound of skylarks singing overhead.

Chris Baines

Independent environment adviser, writer and broadcaster

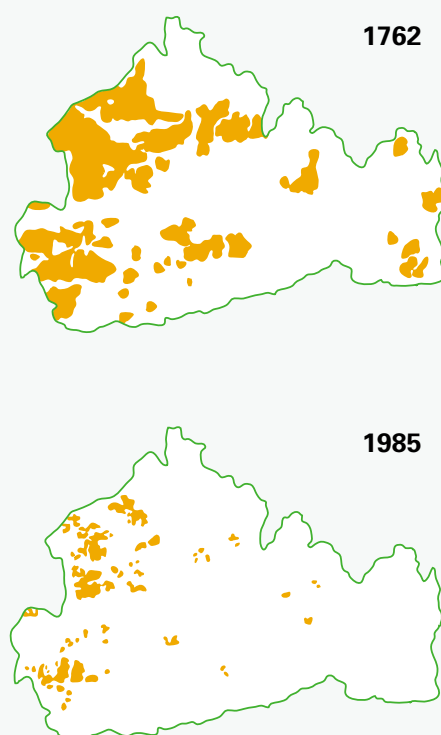
Recovering what we've lost – the case for habitat expansion

During the second half of the 20th century, there was a massive reduction in the area and quality of wildlife habitats in the UK (Table 1). This was caused by changes in agriculture, driven by post-war policies to produce more food, the planting of exotic conifer forests for wood and paper products, and increasing urbanisation to meet the needs of a growing population. Breaking habitats into small fragments damaged them further, reducing the viability of the small area that remained.

But with the new millennium, we're waking up to the scale of the problem for wildlife and for people. The habitats we have lost embrace some of our most treasured landscapes and areas richest in wildlife. We have a simple choice. Do we want vibrant sweeps of living countryside full of wildlife or are we content with an impoverished patchwork of ever more threatened remnants?

The RSPB believes it is time to reverse the decline. It is time to invest in a vigorous

programme of habitat re-creation. Let's put back some of what we've lost – places for wildlife, and for people to enjoy, for spiritual refreshment and recreation.



Loss and fragmentation of lowland heath in Surrey¹

Table 1: Losses of key habitats

Habitats	Examples of losses
Lowland heathland ²	Approx 75% in England since 1800
Downland ³	50% lost in Dorset between 1950s and 1990s
Reedbed ⁴	Estimated 40% since 1945
Wet grassland ⁵	Estimated 40% between 1930s and 1980s
Caledonian pine ⁶	Approx 99% lost – 16,000 ha remains from over 1.5 million ha
Saltmarsh ⁷	Current loss estimated to be 100 ha per year
Upland heath ⁸	27% of heather moorland in England and Wales between 1947 and 1980, about 45% in southern Scotland between 1947 and 1988
Ancient woodland ⁹	In England and Wales, approx 46% converted to plantation or agriculture since 1946

What is our vision?

The RSPB's vision is simple. We need to bolster the habitat fragments that remain in the countryside. By 2020, over 160,000 ha of our most important habitats should be under re-creation management, including heathland and downland, reedbed and other freshwater wetlands, heather moorland, woodlands, and saltmarsh, mudflats and other coastal wetlands.

Realising this vision will be challenging. But it is achievable, practical and affordable – and surely everyone will cherish what it would bring? The RSPB is already helping to restore wildlife habitats through research and direct land management. Our pioneering restoration and re-creation projects are starting to tackle the most urgent wildlife losses.

But to achieve our vision demands coherent action from many organisations. The Government, local authorities, voluntary organisations and the private sector must forge new partnerships and work together to enhance the quality of the countryside for wildlife and people alike.

Where do we start?

The need for new and better managed habitats is clear, and a framework to achieve our vision is already in place. By ratifying the UN Convention on Biological Diversity, the UK Government has made the commitment to conserve threatened species and habitats for the future. It has endorsed habitat and species action plans, prepared by the UK Biodiversity Steering Group, which set targets for conserving those species and habitats requiring the most urgent attention. To implement these biodiversity action plans (BAPs), partnerships have been established between government departments, statutory bodies, voluntary organisations (including the RSPB), land managers and business¹⁰.

Andrew Hay (RSPB Images)



The specialisation and intensification of agriculture has been a major factor in the loss of many habitats. However, agriculture is also a crucial part of the solution – wildlife-friendly farming techniques are vital to the future of much of our countryside.

C H Gomersall (RSPB Images)



The astonishing sight of a male black grouse displaying at dawn is now all too rare. Changes in the upland habitats, which black grouse need to survive, have led to a serious population decline – so serious that this species is a priority for the UK Biodiversity Action Plan.

The enormous loss of wildlife habitats has affected wildlife, and has meant fewer and poorer opportunities for people. Re-creating what we've lost would bring many benefits – biological, social and economic.



David Broadbent (RSPB Images)

Most habitat plans contain targets of three kinds:

- maintenance of high quality habitat
- restoration of low quality to high quality habitat
- re-creation of lost habitat.

Looking after existing valuable areas of habitat is critically important. Although pressures such as development and inappropriate land management still exist, there is a strong legal and planning structure to help protect the habitat that remains and provide for its management. Our most important habitats are protected by the EU Habitats Directive, the Countryside and Rights of Way Act in England and Wales¹¹ and their application through the planning system. Now we must focus on large-scale re-creation. By reducing fragmentation and increasing the habitat area, re-creation can certainly

enhance the quality and robustness of existing habitat and increase security of the wildlife it supports. Re-creation can also help habitats cope with challenges such as climate change and accommodating large numbers of visitors.

At present, many of the habitat re-creation targets contained in BAPs are modest. The RSPB believes it is time to review and increase these targets. For example, in our submission on the Rural White Paper for England, we asked the Government to double the current area of heathland in England by increasing the lowland heathland re-creation target to 32,000 ha, compared with a BAP target of 6,000 ha. Other habitats, such as reedbeds, downland and lowland woodland, should be re-created on a large-scale by increasing their targets beyond the re-creation target contained in the BAPs. Some examples are given in Table 2.

Table 2: Raising our sites, current and proposed targets for habitat re-creation in the UK

Habitats	Existing BAP target (ha)	Existing BAP timescale	The RSPB's proposed target for 2020 (ha)
Lowland heath*	6,000	2005	32,000
Downland*	1,000	2010	10,000
Wet grassland	2,500	2000	5,000
Reedbed	1,200	2010	2,400
Saltmarsh	2,100	2015	3,000
Upland heath*	5,000	2005	10,000
Lowland woodland	20,000	2015	100,000

* A habitat defined in the Countryside and Rights of Way Act 2000 as open country to which a statutory right of access will apply in England and Wales.

What are the benefits?

Achieving our vision is important for wildlife, *and* provides a foundation to deliver wider social, economic and health goals which will benefit the people of the UK. Increasingly, people are realising that sensitive land management can significantly contribute to a better quality of life and sustainable development.

Some of the benefits that habitat re-creation would provide include:

- **Biodiversity**

Investment in habitat re-creation is vital to replace lost habitat and to reduce fragmentation. More 'wild' space – land managed in an environmentally sensitive way – is needed if we are to maintain the variety and abundance of wildlife. It is vital that we provide habitat 'stepping stones' to allow wildlife to adjust to the effects of climate change.

- **Leisure opportunities**

Our most beautiful landscapes are treasured by the public, for walking, picnics and quiet enjoyment of the countryside. A chance to unwind in lovely surroundings is almost universally appreciated, and the countryside provides opportunities for physical and spiritual refreshment. For example, The Countryside Agency (CA) found that, for England, around one in four people visit the countryside at least once a week, and most will do so at sometime during the year. Most just want to go for a walk, perhaps with their dog, while others go horse-riding, cycling, jogging or fishing. Some just want to sit and relax, maybe with a picnic¹². For many, watching wildlife adds an extra dimension to their enjoyment. Indeed, wildlife-watching is now a major leisure activity for many people, and is the main reason for their visits to the countryside. A study in North Norfolk identified birds and other wildlife as the main reason for 34% of the people (115,000) visiting six sites,

and a factor influencing the decision to visit of 59% (200,000 people)¹³. As many as 5.5 million people in the UK may go birdwatching¹⁴. Wildlife watching requires accessible areas with biodiversity interest.

Under the Countryside and Rights of Way Act, a statutory right of access to open country land types is to be provided in England and Wales¹⁵. These open country land types are high in biodiversity interest – over one third of this land is notified as sites of special scientific interest (SSSIs). So, expanding these habitats will provide additional access land, and help to achieve biodiversity objectives¹⁶.

- **Support to local economies**

Nature conservation can bring surprisingly big benefits to local economies, in a variety of ways. Habitat re-creation and management, be it on a nature reserve or under an agri-environment scheme such as the Countryside Stewardship Scheme, is just one element of a growing environment-based economic sector. Improving conservation value of the landscape will increase its beauty and appeal, and so the attractiveness of the whole area, directly improving the quality of life for the area's residents.

Tourism is of course a very obvious and important source of income in the countryside, but a high quality environment that is a pleasure to visit and to live in may encourage investment such as business relocations and major new attractions – or even some more unexpected sources of income. For example, the historical landscape, beautiful scenery and fine buildings of south-west England attract thousands of holiday-makers each year, but it has also made an excellent area for film and media. Bristol is home to the BCC

The nature conservation sector is a significant and growing employer, providing more than 10,000 full-time equivalent jobs in Britain. At a local level, the impact can be particularly significant, especially in promoting the diversification of more remote rural communities suffering from the loss of employment in agriculture.



Nick Thomas

Natural History Film Unit, and the country and stately homes throughout the west have been the backdrop to a number of major films, which inspire more visits to the attractions and the countryside. It has been estimated that in 1997–98, approximately £14 million was brought into the region by the film and media industry. In south-west England, environment-related economic activity contributes about 100,000 jobs and £1.6 billion to the regional economy – some 5–10% of the region's gross domestic product (GDP)¹⁷.

Habitat restoration also makes a more direct contribution to local economies. Important wildlife sites are often in rural, sometimes remote, areas where jobs can be particularly hard to find. For example, in Dorset in 1995/96, the activities of organisations managing and restoring heathland involved direct expenditure of at least £1.2 million. These activities also supported a minimum of 67 full-time equivalent (FTE) jobs through a combination of direct employment and conservation, and visitor and employee expenditures. Much of this spend was

within the Greater Purbeck Rural Development Area – an area recognised to have economic and social problems¹⁸.

Nature reserves in North Norfolk make a valuable, direct contribution to the local economy. This includes direct employment of 35 actual jobs (26.5 FTE jobs), and indirectly, a further four FTE jobs as a result of spending by reserves and their employees, and £137,000 spent on local goods and services. Spending by visitors to these reserves provides additional benefits: for example at RSPB Titchwell Marsh nature reserve an extra £1.81 million each year was spent in the local economy, supporting 39 direct and indirect FTE jobs; and at Cley Marshes (Norfolk Wildlife Trust) an extra £2.45 million was spent each year supporting 52 FTE jobs¹³.

- **Health benefits**

Habitat re-creation is good for wildlife. And it provides a foundation to improve our quality of life and gives direct savings in expenditure on health.

Wildlife habitats provide some of the most rewarding opportunities for a whole

range of compatible recreational activities including cycling, horse-riding and walking. From the sights and sounds of a bluebell wood in spring to the purple haze of late summer heathland, the natural world gives us inspiration and relaxation. Woods, wetlands, heaths and downs are a welcome antidote to often progressively more stressful and sedentary lifestyles.

Increasing physical activity is vital to improving the nation's health. At present, people are, on average, walking 1% less each year. More and more inactivity is leading to poorer health; reversing this trend would bring significant health benefits. For example, mortality is 50% lower in those retired men who walk two miles a day. The risk of a stroke is three times higher in those who abstain from exercise: strokes currently cost the nation £2 billion per annum. Exercise decreases the risk of bowel disease by 40% and also Alzheimer's disease, which costs £4 billion each year to manage. Heart disease costs society some £858 million every year. Government targets to reduce the incidence of these diseases can only be met by increasing physical activity¹⁹.

Indoor gyms don't work for many people. The drop out rate is 80% within six weeks of starting a fitness programme because most do not feel motivated to continue. Initiatives such as the British Heart Foundation (BHF)/CA and BHF/Countryside Council for Wales (CCW) 'Walking the Way to Health' and the British Trust for Conservation Volunteers' 'Green Gym' have demonstrated how the countryside provides vital motivation. The countryside can encourage people to take up physical exercise, and sustain it, because of the enjoyment it brings them.

The countryside's role in increasing people's exercise has been recognised by the Government. In July 1998, Health Minister, Tessa Jowell, stated she would 'like to see Health Walks develop into a network across the country in support of

our ideas for Healthy Living Centres'. In June 2000, the New Opportunities Fund announced a £6.4 million grant to the BHF/CA to support the development of 200 community-based 'walking for health' schemes. People need to feel confident to use the countryside for physical activity – this can be encouraged by providing access routes and places to visit. Enhancing the quality of the countryside will provide the basic motivation for people to participate. Meeting BAP habitat and species recovery objectives will help coincidentally to provide many of the countryside features and wildlife that people value. Thus, including the 'skylark' farmland bird index as one of the Government's Quality of Life indicators²⁰ gives a more direct measure of environmental quality than was perhaps first anticipated: not only for wildlife, but for people as an indication of the quality of the countryside experience.

- **Educational benefits**

One of the frequent problems with urban and suburban habitat re-creation and restoration is vandalism. Historical solutions centred on protecting the habitat from those who might destroy it by using security and exclusion. Current thinking puts education as a core function and benefit of habitat re-creation. Schemes to re-create or restore habitats present a positive opportunity to engage with local communities from the earliest stages of project development. Such schemes often extend public access to the local countryside and provide a long-term resource for education and community involvement.

The contrast between the re-created habitat and the usually degraded habitat alongside it presents an opportunity to explain conservation in a way which is easily understood. Also as re-created habitats are often near to where people live and work, these schemes bring environmental protection into people's everyday lives.



Andrew Hay (RSPB Images)

Many children, especially from urban environments, have no opportunity to experience the wonder of nature and wild places. The RSPB believes that if today's young people do not have the opportunity to experience nature directly, they will not become environmentally -aware.

When the RSPB embarks on a habitat re-creation scheme, the opportunity to build relationships with local communities is a unique chance which the RSPB warmly embraces.

- **Ecosystems with added value**

It is all too easy to forget that we depend on our environment for food, water and places to live. Increasingly, it is recognised that working with nature, rather than against it, can maintain the ecological services on which we all depend. For example, the re-creation of river floodplain wetlands has a crucial role in urban flood alleviation by providing flood storage. Flooding is likely to be an increasingly important issue as climate change bites. At the coast, creating saltmarshes through managed re-alignment of the coastline can help to maintain the integrity of sea defences by reducing wave energy, and thereby the destructive power of the sea. Saltmarsh creation can also have economic benefits. The Environment Agency (EA) estimates that coast defence costs may be £5,000 per metre. A saltmarsh provides a buffering effect and an 80 metre width of marsh fronting an eroding coast can reduce coast defence costs to about £400 per metre – a massive 92% saving to the public purse²¹.

- **Meeting international obligations**

In addition, habitat re-creation work is required to meet the UK Government's obligations under European wildlife conservation legislation and the RAMSAR Convention on Wetlands of International Importance. For example, sea-level rise and climate change are threatening coastal mudflats, grazing marshes and other habitats designated as 'Natura 2000' sites – Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) under the EU Birds and Habitats Directives. Many are listed as RAMSAR sites. If managed re-alignment proves the only viable option to protect their wildlife then there is a legal obligation to create replacement habitat under the Habitats Directive. In England, the Government has adopted a 'no-net loss' policy towards land listed as RAMSAR sites. Currently, saltmarsh is being lost at a rate of about 100 ha per year, and much of this is designated for its international importance for wildlife. Since 1990, only 100 ha has been created – about one-tenth of the compensatory habitat required by law²².

- **Climate change** is expected to cause dramatic changes in the distribution of species and habitats. For example, as lowland and southern areas of the UK become warmer and drier, habitats and species will have to 'migrate' effectively northwards and upwards, following their particular requirements. Habitat re-creation will be an important mechanism to help wildlife cope by ensuring that animals and plants can find the conditions they need as the impacts of climate change grow.

Investment in habitat re-creation at the scale proposed will deliver a measurable improvement in environmental quality – enhancing the quality of life for wildlife and people.

Making it happen

So – we have the vision, but can it be achieved? Do we have the practical knowledge to make it happen? We have no doubt that our proposals are practical and attainable. For several decades, the RSPB has been developing and implementing major habitat restoration techniques. Many of our nature reserves provide examples of what can be achieved given commitment, skills and modest resources.

For many people, RSPB nature reserves are the most obvious and tangible manifestation of the RSPB's conservation work. The RSPB now manages 168 nature reserves covering 114,657 ha of land throughout the UK. These reserves support populations of 79 of the 120 'red' and 'amber' breeding bird species – those listed as being of 'high' or 'medium' conservation concern. RSPB reserves support more than 10% of the UK's populations of 27 species of birds of conservation concern. Over 1.1 million visits are made to RSPB nature reserves each year – a significant contribution to the local, often rural, economy. The RSPB employs 200 staff to run its nature reserves. Visitors to reserves bring extra spending of £11 million each year to local economies, supporting an extra 300 FTE jobs in tourism. The RSPB has also

created more extensive access to high quality countryside through its nature reserves network.

Since the 1930s, land acquisition has grown steadily as a key mechanism for the RSPB to conserve birds and their habitats in a rapidly changing countryside. The RSPB's first nature reserves focused on conserving rare or threatened species – the avocet at Minsmere in Suffolk, the black-tailed godwit at the Ouse Washes in Cambridgeshire, and the osprey at Loch Garten in the Scottish Highlands. Gradually, however, this emphasis has altered to embrace threatened habitats and their characteristic species and now includes re-creating and restoring habitats. Some of the RSPB's best-loved nature reserves, such as Minsmere and Leighton Moss, are largely re-created habitat. Right now, we are developing more major reserves in a number of projects across the UK – the case studies described later are examples. RSPB nature reserves now encompass many of the priority habitats listed in the UK Biodiversity Action Plan. During the last decade, we have initiated re-creation of some 7,600 ha – an area the size of the Isle of Sheppey in Kent (Table 3).



St John Hollis



C H Gomersall (RSPB Images)

Some of the RSPB's best loved nature reserves are re-created habitat. Minsmere was farmland prior to being flooded as part of the nation's defences against invasion.

Table 3: Habitat creation and rehabilitation by the RSPB since 1990

Habitat	Total completed	In progress	Total
Lowland wet grassland	2,063	682	2,745
Reedbed	188	1,051	1,239
Lowland heathland	554	192	746
Blanket bog	180	0	180
Raised mire	71	0	71
Caledonian pine	480	2,020	2,500
Saltmarsh	0	88	88
Saline lagoon	23	3	26
Total	3,559	4,036	7,595



Andrew Hay (RSPB Images)

The range of experts among the RSPB's thousand-strong staff, and innumerable volunteers, includes hydrologists, ecologists, surveyors, land agents, research biologists, wardens and livestock managers. Such a wide range of experience has been instrumental in providing the skills and project management necessary to re-create so much habitat successfully. But wider partnerships of many kinds have been important in making these gains.

- **Practical partnerships** between the RSPB and: specialists in many disciplines eg habitat experts, civil engineers and contractors of many kinds; landowners, farmers and industry; government agencies, such as the drainage authorities, and conservation agencies.
- **Resourcing partnerships** between the RSPB and funding agencies, such as the Heritage Lottery Fund, Charitable Trusts, Landfill Tax distributors and agriculture department agri-environment schemes.
- **Community partnerships**, where the RSPB has joined with local communities to provide benefits for wildlife and people.

The RSPB acquires land for conservation reasons, but often also gains features of archaeological, cultural and historical importance, such as this Celtic cross at Oronsay. These features are investigated and protected, and where possible, interpreted.

CASE STUDIES

from RSPB projects

This section gives examples of the RSPB's habitat re-creation work. Of course, as a conservation organisation, the RSPB's main reason for acquiring nature reserves has been for their conservation importance, but having this network of sites has brought other benefits. It allows us to carry out much important research on the needs of species, how to provide these needs and, following on from this, the opportunity to demonstrate good

conservation land management to others. But our nature reserves also mean that visitors have the chance to see some of these wonderful habitats and their wildlife for themselves – to learn more about them, and simply to enjoy them. These examples help to illustrate the practicality of our vision, and also some of the costs and benefits – and challenges – involved!

Abernethy, Highlands, site of much Caledonian pinewood restoration undertaken by the RSPB.

C H Gomersall (RSPB Images)

The habitat in the UK

Existing grazing marsh in the UK: about 45,000 ha of good quality habitat, 300,000 ha of potential grazing marsh.

Losses: estimated 40% between 1930s and 1980s.

BAP target: grazing marsh

- maintaining existing extent (300,000 ha) and quality
- rehabilitate 10,000 ha
- create 2,500 ha by 2000.

RSPB 'Raising our sites' target: 5,000 ha by 2020.

BAP species include: the reed bunting, water vole, penny royal and true-fox sedge.

Birds of conservation concern include: the lapwing, redshank, snipe, curlew and garganey.

Gerald Downey (RSPB Images)



Wading birds such as the curlew are increasing in number at Otmoor, following wetland restoration work.

1 In the heart of England: Otmoor nature reserve

Seven miles north-east of Oxford, within the floodplain of the River Ray, lies what remains of one of England's best wetlands, and a place of great historical significance.

Over the last 50 years, river engineering has greatly reduced flooding at Otmoor. In the 1960s and 1970s, large areas were drained and converted to arable land which seriously damaged Otmoor's wildlife value. Now the RSPB is re-creating a significant area of wet grassland and reedbed to benefit breeding and wintering wetland birds. Increasing the area of wet grassland in the UK is not only important for wildlife, it can help reduce the flood risk to built-up areas. The area is also

The site

Location: Oxfordshire, map ref SP563138. Within Upper Thames Tributaries Environmentally Sensitive Area.

Acquired: 1997 (freehold) and 1998.

Area of floodplain: about 1,000 ha, most has potential for restoration although not all is suitable for wading birds due to small field size. About 600 ha is still floodplain, but floods are irregular and short-lived.

Area in RSPB management: 220 ha.

Objective: to re-create 170 ha of wet grassland, and at least 22 ha of reedbed, to benefit a suite of species, including at least 10 red-listed and 25 amber-listed birds of conservation concern.



Wet grassland is good for wildlife, but can also help reduce the flood risk to built-up areas by 'storing' winter floodwater.

important as a 'staging post' for migrating birds. Otmoor's key species include the lapwing, redshank, snipe and curlew. Also, Otmoor is the only known UK site for ground beetle *Badister meridonalis*.

Local people are actively involved in the reserve's future. The RSPB appreciates the local people's concerns about the potential problems that visitors' cars could cause, so is limiting the site's national promotion. A Local Schools Discovery Project aims to increase

the sense of understanding of and connection to local heritage among children and their families. The RSPB produces a local newsletter, *Otmoor Update*, and gives talks and guided walks for local people, as well as employing local businesses and contractors whenever possible.

The RSPB purchased this nature reserve with money raised from an appeal to its membership in 1997 and with lottery funding support from the Heritage Lottery Fund.

Achievements so far

- Completed engineering work on reedbed and wet grassland in partnership with EA.
- Restored winter flooding, though area still embanked out of floodplain.
- Carefully calculated water budgets to ensure sufficient water is available under future 'drier summer' climate change scenarios.
- Established pasture on former arable land using ESA seed mix. Let 130 ha of grazing land to local farmers.
- Completed reedbed landscaping on 22 ha (perimeter bund, five meres and over 4 km of ditches), and reed planting underway.
- Grazing marsh: nearly 12.5 km of new ditches, plus enhancement of 5 km of existing ditches.
- Wading birds increased from 41 to 120 pairs by 2000 across whole of Otmoor. Estimated 84 pairs of breeding waders on the reserve – 546% increase since 1997, eg redshanks from four pairs to 20 pairs.
- Using reserve to demonstrate reedbed and grazing marsh creation techniques.
- Project should provide access for 5,000 visitors each year. Created 2.5 km of additional permissive path and a small visitor car park.
- Over 160 people have volunteered to help with the reserve.

Bringing back wetlands – reedbed re-creation

Nearly half of all the UK's reedbed has been lost since the end of World War II, and we urgently need to replace it. With sea-level rise and its effects threatening some of what's left, and future summer water shortages likely, we need to think carefully about where we can establish new reedbeds. Here we describe two of the RSPB's major reedbed re-creation projects, one already well advanced and the other just starting; both are inland with secure water supplies.

The habitat in the UK

Existing reedbed in the UK: about 5,000 ha.

Losses: estimates may be as high as 40% since 1945. Sea-level rise is a serious threat to coastal reedbeds, hence inland reedbeds will become increasingly important.

BAP target: create 1,200 ha new reedbed by 2010 in blocks of not less than 20 ha.

RSPB 'Raising our sites' target: 2,400 ha by 2020.

BAP species include: the bittern, reed bunting, water vole, otter, marsh mallow moth and *Dromius sigma* (a ground beetle).

Birds of conservation concern include: the marsh harrier, bearded tit and Savi's warbler.

2 Lakenheath Fen

With the help of a grant from the Heritage Lottery Fund, the RSPB acquired 242 hectares of carrot fields in 1995 to restore to fen. Further purchases added 56 hectares, including the Botany Bay SSSI, one of the last fragments of the original 17th century fen.

We plan to re-create the reedbed in five stages, each of 20–40 hectares. In time, it will become one of the largest, non-tidal reedbeds in the UK, and an oasis for wildlife in the midst of some of the most intensively managed farmland in the country.



Gerald Downey (RSPB Images)

The delightful, but scarce, bearded tit depends entirely on reedbeds. We hope that stepping-up our work to increase the area of reedbed in the UK will enable its population to recover.

The site

Location: Suffolk, map ref TL696858.

Acquired: freehold, 1995.

Area: 298 ha.

Objective: to re-create and maintain a wetland on arable land of low existing conservation value which will make a major contribution to achieving the UK Government's BAP targets for reedbeds and bitterns. Lakenheath Fen will contribute 134 ha wet reedbed and approximately 90 ha of wet meadow with reed-fringed watercourses.



A few years ago, this site looked just like the surrounding arable fields. As the fen is returning to Lakenheath, so are fenland species which have been lost.

We are using a major bund and ditch system to control water movement and a 4 km perimeter bund and interception drain prevents neighbouring farmland from flooding. We have excavated a series of meres and ditches, which are profiled to give the best possible conditions for bitterns. We have carefully designed these meres and ditches to prevent large roosts of gulls and geese, as these are a potential hazard to aircraft using RAF Lakenheath.

We are planting reed along the banks and progressively raising the water level. As the reeds become established, they will provide

habitat for bearded tits, marsh harriers and up to five pairs of bitterns. We have been testing pioneering techniques in reed establishment and have gained considerable experience and knowledge in the best methods to establish new reeds.

Reed warblers are increasingly common, and marsh harriers now breed. We have re-introduced the rare fen ragwort, and it is gradually spreading. Visitors now come to see the famous golden orioles, which breed in poplars on the reserve, and soon paths and hides will guide visitors to more wildlife spectacles.

Achievements so far

- Engineering phases almost complete.
- Planted 106,800 reed cuttings and 112,000 reed seedlings (grown on site) – a further 30,000 to be planted in 2001.
- Developed reed establishment techniques.
- Reed warbler territories have increased from four in 1996 to 100 in 2000.
- Identified and protected location of potential archaeological resources.
- Created 100 ha of wetland, including meres, reed-fringed channels and wet grassland – excavated 7.4 ha of meres and 16.5 km of channel.
- 200–300 volunteer hours have been given each year to reedbed work.

3 Needingworth wetland project

This is an ambitious project to create the largest freshwater reedbed in the UK and to restore a historic landscape. The removal of nearly 28 million tonnes of sand and gravel next to the River Ouse in Cambridgeshire, followed by carefully planned restoration, has provided an inspired opportunity to re-

create a huge new wetland. There will be enough reedbed to achieve 40% of the UK's national biodiversity target in one go. With our partner, Hanson Aggregates, we aim to re-create a wetland which has lots of space for bitterns and other special wildlife, plus 32 km of new rights of way for walkers, cyclists and horse-riders.



Illustration by Bruce Pearson

An artist's impression of Needingworth – a partnership between the RSPB and Hanson Aggregates will re-create an ancient and wonderful landscape.

The site
Location: Cambridgeshire, map ref TL390740.
Acquired: phased donation of land by Hanson Aggregates to the RSPB 2003–2030, as each phase of aggregate extraction is completed.
Area: about 700 ha.
Objective: to establish an important new wetland which will make a substantial contribution to achieving the UK Government's Biodiversity Action Plan targets for reedbeds and bitterns. It will also support many of the other plants and animals which were once widespread in the Fens, as well as enhancing the landscape and providing a recreational resource for local communities and visitors.

The project has been developed in partnership with Hanson Aggregates and in close co-operation with Cambridgeshire County Council, who are the planning authority. The project was awarded the Royal Town Planning Institute (RTPI) National Planning Achievement Award (2000) for Planning and Biodiversity. The RTPI judges were very impressed with the planning work and the involvement of the local communities during the project's development: they remarked that it 'required a far-sighted approach by the nature conservation bodies concerned, particularly the RSPB, and a flexible approach by the operator' to create this 'remarkable new landscape.' The project has also been described as setting 'a new standard for future restoration projects following mineral extraction on a major scale'.



Andrew Hay (RSPB Images)

It will take 30 years to complete the sand and gravel extraction and restoration, so it is planned to re-create the habitat in a series of phases, using the experience we have gained at Lakenheath Fen and elsewhere. Meanwhile, we believe the project will deliver considerable benefits to local people, as well as the many visitors who will come to see this extensive wetland landscape and its special wildlife.

The bittern has come close to extinction in the UK. New wetland at Needingworth will provide habitat for good numbers of these elusive birds, as well as considerable benefits to people.

Landforming at Needingworth. According to the Royal Town Planning Institute, this project is setting 'a new standard for future restoration projects following mineral extraction on a major scale'. The project won an important award for Planning and Biodiversity in 2000.



Hanson Aggregates

Achievements so far

- Development of a partnership agreement with Hanson Aggregates to implement a wetland restoration scheme, to be managed as a wetland nature reserve, following extensive extraction of sand and gravel.
- Concluded a planning agreement with Hanson Aggregates and Cambridgeshire County Council.
- Scheme designed to deliver significant benefits to local people, visitors and UK biodiversity.

Returning England's lowland heathland

Many heathlands in lowland Britain have been lost or seriously degraded. However, this habitat is now recognised as one of the highest priorities in conservation management. The RSPB owns and manages large areas of heathland – about 1,300 ha of heath and acid grassland – and has a wealth of experience in its management, restoration and re-creation.

The habitat in the UK

Existing lowland heath in the UK: 58,000 ha (55% in England).

Losses: approximately 75% lost in England since 1800.

BAP target: maintain and improve, by management, all existing lowland heathland and encourage the re-establishment of a further 6,000 ha by 2005.

RSPB 'Raising our sites' target: 32,000 ha in England by 2020.

BAP species include: the natterjack toad, nightjar, woodlark, smooth snake, sand lizard, silver-studded blue butterfly, southern damselfly, hornet robberfly and heath bee-fly.



Andrew Hay (RSPB Images)

A large number of BAP priority species, such as this southern damselfly, are totally dependent on lowland heathland.

4 The Dorset heathland project

We established the RSPB Dorset Heathland Project in 1989 in response to severe declines in the extent and quality of heathland. We have concentrated on restoring degraded heathland on land outside of RSPB ownership, using trained and well-equipped teams. In its first 10 years, the project has demonstrated that large-scale lowland heath restoration is viable. We have successfully restored 640 ha of degraded heathland at 39 sites by clearing invading pine, birch, rhododendron and bracken, coppicing gorse and managing heather – this represents more than 10% of Dorset heathland. We work to link patches of heathland, isolated by woodland and bracken, to form more ecologically-viable blocks, which are also easier and less expensive to manage. We are re-establishing a further 161 ha from forestry plantations and some agricultural land. The effects of management on the vegetation and key heathland insects and birds have been tremendous. The

The site

Location: south-east Dorset.

The project operates on over half of the remaining 5,600 ha of Dorset's heathland.

Objectives:

- To increase the area of open heath by 10% (560 ha) in 10 years. This objective was achieved two years early – leaving 1,000 ha of degraded heath which will be restored under the HLF Tomorrow's Heathland Heritage Programme, over the next five years.
- To promote best practice through habitat management training and face-to-face advice, and to influence financial aid through detailed costings.
- To raise the public profile of heathland in Dorset.

C H Gomersall (RSPB Images)



experience we have gained from the project has enabled the RSPB to share practical advice on management techniques. We have also been able to provide costings to assist other heathland managers and those who formulate much needed funding schemes for lowland heathland conservation. Since its inception, the project has worked with the Ministry of Defence (MoD), Forest Enterprise, local authorities, Dorset Wildlife Trust, Herpetological Conservation Trust, English Nature and private owners.

The RSPB's Dorset Heathland Project has successfully demonstrated that heathland restoration on a large scale is viable.

C H Gomersall (RSPB Images)



Restoration of heathland has led to an 86% increase in woodlark numbers in nine years on areas managed by the RSPB Dorset Heathland Project.

Achievements so far

- On the 860 ha which are monitored, key bird species increased between 1991–1999: nightjar pairs from 47 to 82 (+74%), woodlark pairs from 14 to 26 (+86%), stonechat pairs from 21 to 45 (+114%) and Dartford warbler pairs from 47 to 141 (+157%).



Andrew Hay (RSPB Images)

The RSPB’s Minsmere heathland re-creation project is a major experiment in re-creating heathland from arable land. The first block is now grassland, and is being grazed with sheep to encourage acid grassland plant species.

5 Minsmere heathland re-creation project

The RSPB’s Minsmere heathland re-creation project is a major experiment in re-creating heathland from arable land. In one of the largest heathland re-creation projects ever carried out in the UK, the RSPB acquired two blocks of agricultural land with high soil

fertility and set about testing ways to re-create heathland. These fields had been in arable production for at least 150 years, the soil pH was too high to allow heathland to establish naturally, and there was no heathland seedbank. The project has investigated a number of techniques to reduce the soil nutrients, such as nutrient stripping by arable cropping, and to reduce

The site

Location: RSPB Minsmere nature reserve, Suffolk, map ref TM460672.
Area: 181 ha. Part of Westleton/Dunwich complex, at 380 ha one of the largest remaining blocks of the Suffolk Sandlings.
Acquired: freehold, 1989.
Objective: to use two blocks of former low-grade, agricultural land to test and demonstrate various management techniques, particularly reduction of soil fertility. Also to provide breeding habitat for stone-curlews and woodlarks.

the soil pH, by using bracken, pine litter and sulphur. Some of these techniques were adapted from trials elsewhere, but at Minsmere the soil has retained nutrients with great tenacity. It is proving quite a task to ensure the soil is suitable for heath to establish. We are making the information we have gained widely available via a number of published papers, theses and reports, creating a significant bank of data and costings to help other re-creation projects. One block of land is now developing into an acid grassland complex, appropriate to the area. We are continuing the soil fertility reduction trials on the other block.



Michael W Richards (RSPB Images)

Loss of the habitat which nightjars need has led to a serious population decline.



Colin Carver (RSPB Images)

Like the nightjar, the sand lizard is a BAP species that depends on heathland. Restoration and re-creation benefits these species.

Achievements so far

- Established grassland on the first block. Using sheep grazing to encourage the establishment of acid grassland plant species.
- This block is now suitable for nesting stone-curlews, with the open sight-lines, carefully sited hedges to screen paths and roads, and plots of bare soil, which are managed as nesting plots.
- Woodlarks now use this block regularly to feed. Loose silky bent grass and storksbill, characteristic heathland plants in this area, now growing.
- Cropping second block with rye and linseed to reduce soil fertility, prior to acid grassland/heathland re-creation as for the first block.
- Completed several scientific trials and studies on the two blocks; studies are continuing.



'There is very little point in harking back to landscapes lost, however fond the memories might be. This is a new millennium – a time for taking positive steps to make amends. Although we may have lost much of the nation's wildlife in the past half-century, the good news is that we can bring it back.'

Chris Baines



The habitat in the UK

Existing: 3.7 million ha, 1.6 million of which less than 50% heather dominance.

Losses: 27% of heather moorland in England and Wales lost between 1947–1980, 18% in Scotland lost between 1940s and 1970s.

BAP target: to achieve favourable condition on all upland heathland SSSIs and ASSIs and 50% of the rest by 2010. Also to initiate re-creation of 15,000 ha by 2005.

RSPB 'Raising our sites' target: 10,000 ha by 2020.

BAP species include: the black grouse, skylark, pearl-bordered fritillary and otter

Birds of conservation concern include: the hen harrier, merlin, golden plover and curlew.

Also at Lake Vyrnwy: nationally scarce bog sedge and cloudberry.

6 Lake Vyrnwy

The Lake Vyrnwy reservoir provides water for Liverpool, but the uplands surrounding it are a model of enlightened management. In 1996, the RSPB entered into a farming partnership with Severn Trent Water who own the reservoir and surrounding estate. Much of the heather has been lost because of overgrazing in the past, but work to rectify this began in 1996 when we halved the numbers of sheep. We are restoring the heather moorland by burning and cutting, which creates more feeding areas for red and black grouse, and by removing the sheep from the hills during the winter to prevent damage to the heather. We are



C H Gomersall (RSPB Images)

Under a farming partnership with Severn Trent Water, restoration of the heather moorland at Lake Vyrnwy is creating better habitat for birds such as this merlin.

The site

Location: Lake Vyrnwy, Powys (in Berwyn Mountains) part SSSI, part SPA, part SAC, map ref SH980220.

Reserve established: 1977.

Area: total 10,090 ha, of which freehold 534 ha, leasehold (from Severn Trent Water) 82 ha, management agreement 9,474 ha. Managed in partnership with Severn Trent Water, Forest Enterprise (conifer plantations), Countryside Council for Wales and Lake Vyrnwy Hotel (hold sporting rights).

Objective: to demonstrate management of a viable and efficient modern farming operation, while taking full account of conservation and catchment protection priorities.



The farm has been in organic conversion since 1998 and will soon be producing organic lamb and beef.

using the reserve's own heather seed to re-establish heather on acid grassland areas. In 1998, the farm entered organic conversion, to produce organic lamb and beef. We have started to grow organic fodder crops on the farm's in-bye land, and are now self-sufficient. This is good for the farming operation, and also provides desperately needed open nesting sites for

lapwings in spring and stubbles for winter finch flocks.

Lake Vyrnwy is popular with visitors as it has a wide range of activities from water sports on the lake to walking in the hills and forests. Restoring and managing the heather moorland will ensure a beautiful landscape for generations to come.

Achievements so far

- Greatly increased sheep condition and lambing performance. Sheep now forage more widely, eliminating localised overgrazing.
- Restored heather – 100 ha is rehabilitating through reducing grazing. Within some blocks, there is more active management by re-seeding with heather seed – a total of 40 ha.
- Black grouse on the reserve have increased. There were three males in 1998, 10 in 1999 and 12 in 2000. Red grouse numbers are increasing slowly and five pairs of merlins bred in 1999, the second best number ever.
- Farming operation in organic conversion – will be fully organic in August 2001.
- Farm self-sufficient in fodder crops, with 35–40 ha, which also provide vital habitat for lapwings and winter finch flocks
- Severn Trent Water has installed an innovative sheep dip design which greatly reduces risk of contaminating sensitive water resources.

The Flow Country

The habitat in the UK

Existing: approximately 1.5 million ha of this globally scarce habitat, mostly in Scotland.

Losses: more than 60% is estimated to be very badly damaged.

BAP target: 845,000 ha to be in favourable conservation status by 2015.

BAP species include: the common scoter.

Birds of conservation concern include: the golden plover, hen harrier, merlin, dunlin, greenshank and black-throated diver.

7 Forsinard

The globally important Flow Country of Caithness and Sutherland is probably the largest remaining expanse of blanket bog in the world. It is fragile and easily damaged: in the UK, it is estimated that 60% is so damaged that it will require considerable effort to recover, and some may be too degraded to merit action. Forestry destroyed large areas of this ancient landscape by lowering the water table and thus drying it out, and by fragmenting the open landscape needed by breeding waders and other birds of this habitat. The RSPB was instrumental in persuading government to remove grants and tax incentives that encouraged forestry and damaged the Flow Country.

In 1994, a partnership of the RSPB, Scottish Natural Heritage, Caithness and Sutherland Enterprise and Fermanagh District Council obtained co-funding from the EC LIFE-Nature Programme, to promote the importance of the peatlands to local people in the Flow Country and Fermanagh, Northern Ireland, and for habitat restoration. When, as part of this initiative, we launched



C H Gomersall (RSPB Images)

The RSPB has gained considerable experience of restoring blanket bog. This fragile habitat is home to vulnerable species such as the black-throated diver.

The site

Location: Caithness and Sutherland, map ref NC891425.

Acquired: 1995.

Area: originally 7,252 ha. Holdings in Flow Country since extended to 11,504 ha.

Objective: to maintain and enhance the integrity and quality of the internationally important peatland on the reserve, along with the associated birds and habitats.



A major project in the Flow Country has helped local communities to appreciate this wonderful place, and has brought significant economic benefits.

an appeal to our members to buy Forsinard Estate, the enormous response showed that, although wild and remote, the peatlands are greatly valued by the public.

Forsinard is now a firmly established visitor attraction, with an innovative nature trail (the Dubh Lochan trail), guided walks and live CCTV images of breeding hen harriers displayed in the visitor centre in the railway station. An education officer and a special arrangement with ScotRail have helped

almost 2,000 schoolchildren to visit this remote place since 1995. RSPB staff now have considerable expertise in managing and restoring blanket bog, and have used it on 15 damaged blanket bog sites across the Flows so far. We have tackled the difficult job of restoring afforested peatlands, with agreement from the Forestry Authority. New restoration techniques are being developed, but it is difficult and expensive, and likely to take decades for the blanket bog to recover.

Achievements so far

- Leased sporting rights: trout fishing to local hotel, deer management to neighbouring estate. Leased grazing rights to local interests, in recognition of importance to local economy. Deer management to prevent damage to important habitats is a legal obligation in Scotland.
- Over 18,000 visitors between 1995 and 1998. In 1997, visitors to the reserve contributed an additional £185,000 to the local economy.
- Helped to convince local people that blanket bogs are special with guided walks, CCTV and an annual celebration of International Bog Day.
- Cleared trees from 202 ha of afforested peatland and blocked 20 km of hill drains using various techniques. Key peatland plant species now recovering.
- Ground-nesting species such as the golden plover and dunlin now benefiting from removal of trees near breeding sites. Assessed impact of fishing activity on black-throated divers and now encourage appropriate practices.
- New LIFE-Nature funding just announced will allow further work in the next four years.
- Shared practical experience through guides and demonstration days.

Caledonian pinewoods

The habitat in the UK

Existing native pinewood in the UK: approximately 16,000 ha, all in Scotland.

Losses: probably 99% – historical area may have been more than 1.5 million ha.

BAP target:

- Maintain remnant native pinewood areas and restore their natural diversity of composition and structure.
- Regenerate and expand a total of 35% of the current wooded area of remnant native pinewoods by 2005, predominantly by natural regeneration.
- Create conditions by 2005 for a further 35% of current area to be naturally regenerated over the following 20 years, mainly by removal of non-native planted species and/or genotypes and the control of browsing levels.
- Establish new native pinewood over a cumulative total area of 25,000 ha by 2005.

BAP species include: the Scottish crossbill, capercaillie, black grouse, wryneck, red squirrel, Scottish wood ant, narrow-headed ant, *Osmia uncinata* (a mason bee), *Blera fallax* (a hoverfly), *Chrysura hirsuta* (a cuckoo wasp), *Clubiona subsultans* (a spider), pearl-bordered fritillary, twinflower, several tooth fungi species and *Cladonia botrytes* (a fungus).

Birds of conservation concern include: the crested tit and osprey.

Other than birds, about 3,000 species of plants and animals have been recorded across the whole of the Abernethy nature reserve, of which 795 are rare or nationally scarce.



C H Gomersall (RSPB Images)

8 Abernethy Forest nature reserve

The forest at Abernethy is probably best known as the home of the famous Loch Garten ospreys. But it is also the largest surviving fragment of the once vast native pine forest that stretched across the Highlands. Loss and fragmentation of this habitat has seriously threatened some of the special wildlife found here, such as the capercaillie, Scottish crossbill, red squirrel, and internationally important plant and invertebrate communities.

A male capercaillie. Restoring part of the once vast caledonian pine forest is a huge task, but essential to the future of the plant and animal communities that depend on it.

The site

Location: Abernethy, Highlands, map ref NH978183.

Acquired: freehold – first acquisition Loch Garten 1975, 12,778 ha wholly owned.

Area: 3,347 ha pine forest of which 1,935 ha is native pine, 1,412 ha is plantation pine.

We are slowly restoring this area from past forest management by:

- expanding the forest by natural regeneration
- re-establishing the intricate mosaic of forest bogs by removing exotic conifers and by blocking drains to reinstate natural water tables
- creating a more open structure within some of the plantation areas by thinning the stands
- increasing the deadwood component of the forest, so vital to many species.

The very high number of deer threatened the forest, as few young trees were able to survive the deer browsing. One method to improve forest regeneration has been to reduce deer grazing: this also meant that deer fences, which kill so many capercaillies and black grouse, could be removed.

Restoring the forest is an ambitious project with a long timescale; you can see great improvements already, but the work will continue for decades to come.



A major restoration project at the RSPB's Abernethy nature reserve is returning the site to its former glory.

Andrew Hay (RSPB Images)

Achievements so far

- Removed or thinned plantation pine to create a more natural woodland structure.
- Started to expand the woodland area through natural regeneration by reducing grazing pressure by approximately 60%.
- Tree regeneration has started to appear in the open areas within the forest and in parts along the forest 'edge'.
- Removed 27 km of deer fencing from within the forest helping capercaillies by reducing collisions, opening up shelter for deer and improving the landscape qualities of the nature reserve.
- Use the reserve for demonstration purposes – discussing reserve monitoring and management techniques with a wide range of land managers, landowners and students, and promoting best practice.
- In 1996, a survey found that visitors to Abernethy nature reserve contributed an estimated £1.7 m to the local economy, supporting 69 FTE jobs. Use of local contractors added another 18 FTE jobs.
- Gained experience vital to the work at Corrimony, near Inverness. At Corrimony, we are restoring 615 ha of plantation and open ground to Caledonian pine forest – there is potential for about 1,361 ha in total.
- Ospreys recolonised by first breeding at Loch Garten in 1954; protection of this site by the RSPB permitted the successful recolonisation of the rest of Britain.
- With the help of other specialists, gained an understanding of the wildlife present on this vast site. This will be the basis of monitoring future changes.

Lowland woodland

The habitat in the UK

Area: lowland woodlands cover approximately 1.5 million ha of the UK, of which ancient and semi-natural woodland covers approximately 200,000 ha.

BAP species include: the turtle dove, bullfinch, dormouse, *Sarcodon scabrosus* (a fungus), and *Boletus regius* (a fungus).



Roger Wilmshurst (RSPB Images)

As large areas of once-thriving coppice woods fell into decline, so did the fortunes of species such as the pearl-bordered fritillary butterfly.

9 Tudeley Woods

People have used Tudeley Woods for a thousand years: to supply fuel for iron smelting, as a source of timber for London houses and great ships, for fencing, hop poles, and hurdles. In the early 1900s, exotic trees were planted in place of many native species. In the 1950s, the hazel and ash coppice fell into neglect as the demand for coppice products declined. As a result, as in so many of England's coppice woods, the wood's special wildlife also dwindled.

Our coppice restoration programme has re-created a once widespread, but now almost unique woodland habitat. The extensive, dense coppice stands are home to many migrant warblers, and also nightingales, turtle doves and bullfinches. Nightjars nest on the open, young chestnut coppice plots, while dormice use the hazel coppices. Tudeley Woods is the only recorded site in Kent for the silver-washed fritillary. This butterfly has recently colonised the reserve as a result of our coppice and ride management. We are

The site

Location: Tudeley Woods, west Kent, map ref TQ620430.

Acquired: management agreement 1987 (owned by Hadlow Estate).

Area: 287 ha.

Objective: to maintain and enhance the woodland for a range of biodiversity and to illustrate how nature conservation objectives can be compatible with commercial land management techniques.



The re-introduction of traditional practices such as hazel coppicing has been good for many species. The hazel makes excellent charcoal, which generates income from the wood.

working to improve the woodland further and encourage the pearl-bordered fritillary to return. The wood has an important fungal community – we have recorded 820 species and seven of them are UK BAP species. Charcoal-makers and hurdle-makers work in the woods as well as coppice and timber contractors. Their work directly benefits the wildlife of the open habitats.

In spring, the glades at Tudeley Woods are awash with flowers.

Achievements so far

- Restored 33 ha of derelict hazel coppice to benefit birds, mammals, plants and butterflies.
- Linked the extensive open ride and glade network with coppice plots to benefit rare and local fritillary butterfly populations and other invertebrates.
- Tudeley was the first woodland in southern England to be awarded the Forestry Commission's Centre of Excellence Award in all four categories, and to receive Forestry Certification (FSC) for its produce.
- Produce 12–15 tonnes of high-quality charcoal each summer, retailing at over £50,000 in supermarkets and DIY stores. Harvest several thousand hurdle rods during the winter for use in traditional hedge-laying or for producing hurdle fences and rustic garden furniture. Other produce includes firewood, pulpwood for the paper industry and oak beams for barn and house restoration. Produce traditional sweet chestnut paling fencing and split rails on site.

The habitat in the UK

Sea-level rise and increased storminess are the main threats facing these BAP habitats: mud and sandflats, saltmarsh, shingle, sand dunes, coastal lagoons, coastal freshwater reedbed, coastal grazing marsh and coastal heath.

Estimated targets: over 10,000 ha intertidal wetland must be created over the next 50 years to avoid net loss of habitat.

BAP species include: the natterjack toad, *Anisodactylus poeciloides* (a ground beetle), *Anostirus castaneus* (a click beetle), lagoon sand shrimp, starlet sea anemone, *Orthotylus rubidus* (a bug) and red hemp nettle.

RSPB initiatives and coastal re-alignment

We own or lease 18,599 ha of estuarine habitats, 410 ha of coastal lagoons and brackish pools (32% of the UK total) and 820 ha of shingle (20% of the UK total); 47 of our reserves may be affected by sea-level rise. We will acquire sites for intertidal creation. In acquiring sites outside coastal flood risk areas, we will create freshwater wetlands to replace those lost to managed re-alignment. We plan to use Freiston Shore and Havergate Island to demonstrate the practicalities of managed re-alignment, and to show the multi-purpose benefits of new intertidal habitat. We hope we can change perceptions of how the coast is managed, within sea and coast defence authorities and with the public.

10 Freiston Shore

Accelerating sea-level rise and increased storminess – the result of global climate change – are placing mounting pressure on UK coastal defences and the land which they protect. Extensive areas of intertidal habitats, that provided natural protection to these sea areas, are being lost to ‘coastal squeeze’ – the intertidal land is eroded as it is progressively squeezed between the hard sea defences and the rising sea-level. Intertidal habitats, such as saltmarsh and mudflats, provide important sites for wintering and breeding bird populations, and have a diverse range of highly specialised vegetation and invertebrates.

Intertidal habitats are disappearing at an alarming rate. In some of the worst affected areas of UK coast in Essex and Kent, over 20% of the saltmarsh, 100 ha, was lost between 1973 and 1998. Often, the only



Roger Wilmshurst (RSPB Images)

Inter-tidal habitats are being lost to the effects of climate change at an alarming rate. This is bad news for species such as the natterjack toad, which is found in coastal dunes.



Managed re-alignment, shown here at Freiston, can bring wildlife benefits and significant reductions in flood defence costs.

sustainable option for mitigating the increased flood risk and loss of intertidal habitat associated with sea-level rise is the creation of new intertidal habitat through managed re-alignment. Current sea defences can be carefully breached to allow a controlled flood to a line landward of the present defences. The new saltmarsh or intertidal flats act as a buffer zone between the sea and the land during high tides and storm floods, reducing the waves and allowing the coast to respond more naturally to changes in sea-level. As well as benefiting wildlife, managed re-alignment

will bring significant reductions in flood defence costs.

The RSPB, in partnership with statutory and other non-government organisations, is actively involved in the managed re-alignment of a number of UK sites, in an attempt to re-create some of the intertidal habitats lost, and return the coast to a more natural and sustainable state. We are also investigating techniques such as tidal exchange, already used in the US, the Netherlands and Germany.



Even mudflats have their splendours! Urgent action is needed if we are to stem the loss of intertidal habitats and the wildlife spectacles that they can offer.

Projected benefits

- Creation of habitat to compensate for that lost.
- Creation of more sustainable and economically viable sea defences.

11 Hope Farm: a new hope for farmland birds

The impact of modern agriculture is so substantial that addressing the resulting declines in farmland bird numbers has become one of the UK's biggest conservation challenges. We acquired Hope Farm to help meet the challenge of developing and testing farming techniques that can produce food cost-effectively and benefit wildlife. This project, undertaken on a sound science base, will complement the work done by others to 'restore' our countryside to one which is rich in farmland birds and other wildlife.

We are trying things that most farmers cannot yet do because of economic, technical or information constraints. We will use this farm to explore a more wildlife-friendly future for farming and to put our ideas to the decision-makers who influence UK farming. The farming techniques we develop will be carefully selected, based on their environmental, agronomic and financial benefits.



RSPB Images

Roesel's bush-cricket. We hope the techniques we trial at Hope Farm will help this and other invertebrates, as well as other wildlife.

The site

Location: the farm's precise location is not being disclosed, as it is a working farm, not a nature reserve. It does not have facilities for general visitors. The farm is in Cambridgeshire and is known to RSPB members and the general public as 'Hope Farm'.

Acquired freehold: full occupation of land and buildings April 2000.

Area: 181 ha – predominantly arable land (169 ha), currently growing all autumn-sown crops of wheat (100 ha) and oil seed rape (50 ha), and 19 ha of set-aside. There are several pasture fields, currently grazed by horses.

Objective: to trial, demonstrate and advocate new farmland management techniques that favour farmland birds.

BAP species on Hope Farm include: the skylark, linnet and brown hare.

Birds of conservation concern include: the swallow, song thrush, house sparrow, goldfinch, bullfinch, linnet and reed bunting.

Also found so far: the scarce broad-leaved spurge *Euphorbia platyphyllos*, 22 species of butterfly and Roesel's bush-cricket.



Our overall strategy for Hope Farm is to trial, demonstrate and advocate new farmland management techniques that favour farmland birds.

In the early years, emphasis is being placed on techniques to improve the ‘within’ field interest, rather than field boundaries and margins, as less attention has been given to this. Based on our skylark research, we are testing the value of providing bare patches as nesting sites for skylarks. These are created by briefly turning off the seed drill when planting.



Mark Hamblin (RSPB Images)

Trials are already underway to develop cost-effective ways to improve the value of winter wheat to nesting skylarks. Skylarks have declined by 52% since 1966.

Our strategy for Hope Farm

The overall strategy for land management at Hope Farm over the next 10 years has three phases: a period in which baseline data are collected, an experimental phase, and a phase where ideas, then proven, are implemented across the farm.

At present, we expect work will explore three key biological objectives:

- to improve the value of winter wheat to nesting skylarks by creating ‘skylark scrapes’ – open patches within which they can nest
- to develop the most cost effective strategy for increasing winter bird food on arable farms
- to develop a rotation as profitable as autumn-sown cropping which provides the benefits to birds of spring-grown crops.

The habitat in the UK

UK BAP habitats at Fairburn Ings: mesotrophic lakes, reedbed, lowland meadow.

BAP species of these habitats include: the grey partridge, turtle dove, skylark, song thrush, tree sparrow, linnet, bullfinch, reed bunting, corn bunting, water vole and pipistrelle bat.

Birds of conservation concern of these habitats include: the black-necked grebe, garganey, redshank, whooper swan and golden plover.



Andrew Hay (RSPB Images)

Looking at these attractive wetlands and the new visitor centre, it is hard to believe that this is a post-industrial site close to several large urban areas.

12 Fairburn Ings: healing the scars – a post-industrial landscape

Close to Leeds, Wakefield, Castleford, Pontefract and Selby is an area of former coal workings. Next to it are a power station, a chemical works, a railway and a trunk road. Yet here we have created a reserve that is home to large numbers of birds, and at the same time is a gateway for local people to experience the beauty and wonder of wildlife and wild places, close to these big urban areas.



C H Gomersall (RSPB Images)

Roosting redshank. Numbers of breeding wading birds have trebled in the last eight years at Fairburn Ings.

The site

Location: West and North Yorkshire, map ref SE451277.

Acquired: (freehold/leasehold/management agreement) 1976.

Area: 277 ha.

Objective: to maintain the site for its nationally important numbers of wintering and breeding waterfowl and other wetland wildlife.



The RSPB's work here includes the creation of excellent facilities for all visitors, including school parties, giving many an all-too-rare opportunity to experience wildlife.

Humans have always used Fairburn Ings. The Romans probably quarried for gypsum, the Vikings started the draining that turned its wetlands to farmland, and over a hundred years ago it became a major coal mining area, with huge spoil heaps. The ground gradually subsided over the old workings to create pools, and by the time the last mine closed the wetlands had returned and the land was useless for arable farming. In 1968, after petitioning by a local naturalist, it became an official bird sanctuary – the beginning of 40 years of community involvement and input. It became an RSPB reserve in 1976. There is a local tradition at Fairburn of feeding the swans – now the resident mute swans are joined by a resident herd of whooper swans each winter, and people come to birdwatch.

Much is being done by the voluntary sector to reach people who haven't previously found it easy to visit wildlife places, perhaps because of disability or a lack of transport – the opportunity to visit sites with wonderful wildlife should be there for all. The wetlands at Fairburn Ings are used for fishing, families feed the ducks and many come just for a walk – there is no charge for access. The reserve itself has a major education programme, and thousands of schoolchildren come each year to learn about wildlife and to enjoy the ever-popular pond-dipping. There are over 1,200 schools close enough to visit, many with inner city children with little experience of the countryside – about 4,000 children visit each year. Trails suitable for wheelchairs and a new visitor centre (built with landfill tax funds) provide facilities for all.

Achievements so far

- Numbers of breeding waders trebled in eight years.
- 120 ha of colliery spoil heaps in final year of restoration to a complex mosaic of woodlands, wetlands and herb-rich grassland.
- Skylarks have increased from two pairs in 1994 to around 40 pairs currently.
- Around 7,000 golden plovers roost in winter.
- Excellent facilities for disabled visitors include five designated parking bays, 600–800 m of boardwalk and a hide and new visitor centre, fully accessible to wheelchairs. A swan feeding platform/lakeside viewpoint will be built in 2001.

A 'checklist' of best practice for restoration projects

Based on our experience of habitat re-creation projects, a wide range of issues has to be addressed during the development of any proposal. Some, if not resolved, could be fatal to a project and prevent its implementation. Others are more about realising the full potential benefits of a scheme, not only for conservation but also the wider community.

Considerations include:

Physical/climatic

- suitability of soils and underlying rocks
- topography
- water availability
- implications of climate change and sea-level rise
- size

Legal and administrative

- planning permission
- SSSI/Area of Special Scientific Interest in Northern Ireland (ASSI) consent
- if SPA/SAC, appropriate assessment under Habitats Regulations?
- proximity of airfields (to avoid risk of bird strike)
- water abstraction licences
- Rights of Way
- other land management rights (commons, sporting)
- Reservoirs Act consent
- land drainage consents
- toxic waste/derelict land issues

Finance

- capital funding for habitat restoration works
- revenue funding for ongoing site maintenance
- opportunities for income generation from visitor services or goods grown on-site

Wildlife

- impacts on existing flora and fauna, beneficial and adverse. Includes assessment of origin of plant stocks
- role of natural processes – can habitat expansion be achieved by assisting natural regeneration?

People

- local community involvement
- visitor facilities, including disabled access
- education opportunities, formal and informal
- employment opportunities
- provision of goods from the site (eg timber produce, charcoal, mulch, reed for thatching)
- opportunities for volunteering.

As well as considering many of the issues listed above, careful thought is needed to ensure that the right personnel are involved and the necessary organisational partnerships are in place for the project to succeed.

Besides technical expertise, there are two other main ingredients needed to deliver large-scale habitat restoration in the UK: resources and commitment.

Financing habitat re-creation

We calculate that £20 million per annum, on top of current nature conservation expenditure, is needed to undertake a habitat re-creation programme of the scale we envisage. We derived our estimate from the level of incentives paid to land managers through agri-environment and other schemes, and from knowledge of habitat re-creation programmes on our nature reserves.

Modest additional money will be required to achieve our vision. But we believe the bulk of this money can be provided at relatively little cost to the Treasury through better allocation of existing funds. In the medium to long-term, this investment should bring substantial and widespread benefits to the public – and may even result in some savings to the public purse. Indeed, this investment may help the Government go some way towards the action it will need to take to combat the effects of climate change.

There are many sources with the potential to provide substantial funds, by directing or re-focusing expenditure towards habitat re-creation work. These include:

- **Statutory conservation agencies**
SSSI/ASSI management agreement payments.
- **Agriculture departments**
These are becoming a significant source of money for habitat management and re-creation, particularly with the introduction of modulation across the UK (which transfers expenditure from direct



David Noton (BBC NHU Photo Library)

agricultural support to agri-environment schemes). Increasing payment rates for agri-environment schemes would help to attract more farmers to habitat re-creation options. It would also help to increase support for the further transfer of funds from direct subsidies to the agri-environment budget, through modulation.

- **Environment Agency**
Switching flood defence expenditure from 'hard' flood defence work to 'soft', flexible, natural wetland-based options. Recent floods have highlighted the need to reform land drainage policy: wetland restoration is needed to provide homes for wetland wildlife and increase washland storage to reduce urban flooding. Upland peatlands need to be restored, so that they can act as natural 'sponges' and reduce run-off from uplands.
- **Positive planning agreements**
Developers and planning authorities should increasingly promote positive planning for biodiversity in their

Increasing payment rates for agri-environment schemes would help to attract more farmers to take up habitat re-creation options.

development schemes and through their development plans. For instance, house-builders can include large, priority habitat blocks as part of their landscaping schemes, and minerals operators can restore worked minerals sites to appropriate targeted habitats, such as reedbeds and heathland, in their after use/restoration schemes. Some planning authorities can, for example, strategically identify habitat restoration opportunities in minerals local plans and secure these through planning agreements associated with minerals planning permissions.

- **Forestry Commission**
Forestry Commission budgets could be used to support heathland re-creation through relocating modest areas of plantations and further investing in lowland native woodland planting and management.
- **Ministry of Defence**
Funds could be used to facilitate habitat management and restoration work on the training areas within their management, which includes important

lowland heath, chalk grassland and upland habitats. There is a need to increase use of the UK training estate for military training, so the estate could be extended and the land restored to semi-natural habitats, such as upland or lowland heath, or chalk grassland.

- **National Lottery**
National Lottery funds should continue to deliver both capital and revenue biodiversity projects. The Heritage Lottery Fund has contributed 8% of its budget towards land projects. The New Opportunities Fund could support inspiring restoration and re-creation projects that will breathe new life into habitats for wildlife and people.
- **Innovative sources of funding**
Such sources should be developed. For example, Landfill Tax has influenced waste generation *and* has raised important revenue for environmental schemes, including nature conservation. The announced Aggregates Tax, through its associated Sustainability Fund, also offers potential revenue for environmental improvements over and above those

'Soft' coastal protection options such as saltmarsh can be much more cost-effective than 'hard' defences such as sea walls, and provide vital habitat for many species.



C H Gomersall (RSPB Images)

required by planning consents, which we believe should include national and local biodiversity conservation projects.

- **European Union**

EU funding sources which could enable habitat re-creation include Structural Funds where this is shown to provide economic benefits by promoting recreation/tourism or promote inward investment by enhancing environmental quality, and the LIFE-Nature fund, where this supports management of the Natura 2000 network of SPAs and SACs.

We acknowledge that some bodies may find it difficult to redirect their budgets to fund habitat re-creation and restoration:

Government encouragement may be required. In a few instances, we anticipate that priorities may require attention as part of the UK Government's review of its spending priorities under its regular Comprehensive Spending Review process.

To these sources of public funding can be added:

- **The private sector**

Companies with major land holdings, such as the water companies (see the case study on Lake Vyrnwy for an example) are potential sources of funds. Also the Government is encouraging the private sector to become BAP 'Champions' which includes providing money to help achieve species and habitat recovery targets.

- **Voluntary conservation organisations**

The public are direct stakeholders in habitat re-creation through organisations such as the RSPB – over 70% of our annual income comes from contributions from our one million members. Contributions from non-governmental organisations such as the RSPB often act as 'seed-corn' money to match other sources of funding, so creating far larger projects than could be achieved by any one organisation alone. Over the next five years, with the support of our members, the RSPB will increase its



Andrew Hay (RSPB Images)

Habitat restoration projects provide opportunities for local people to become involved through volunteering: here a volunteer is gathering reed seed for a major restoration project.

expenditure on nature reserve acquisition to about £4 million per year. Within this, we shall expand the amount of habitat restoration we do. We shall also continue to share the knowledge and experience gained on our nature reserves to assist with the re-creation and improvement of wildlife habitats on other people's land throughout the UK and beyond.

Partnerships will be essential to achieving our vision – with farmers and landowners, government agencies, and many others.



Andrew Hay (RSPB Images)

Commitment

As we said at the beginning of this document, achieving our vision presents a real challenge. Partnerships between a range of diverse agencies are essential. At the national level, support from the UK Government and country administrations is crucial to create the correct conditions for habitat to be re-created. Government agencies must contribute positively to habitat restoration and re-creation projects, whether in their regulatory role or as land managers. This commitment involves not only political will, but an assurance that the legislative and policy framework works for habitat creation, rather than against it. Policies, such as agriculture, land use planning and water management, should be integrated to ensure a coherent approach to biodiversity protection and enhancement. The current framework, although improving, is still fragmented and in some cases has policies that are contradictory. These contradictions impact on the funding available for habitats. The RSPB is actively involved in enhancing the policy framework to encourage habitat creation. Government agencies should also help to stimulate funding for habitat restoration and re-creation projects.

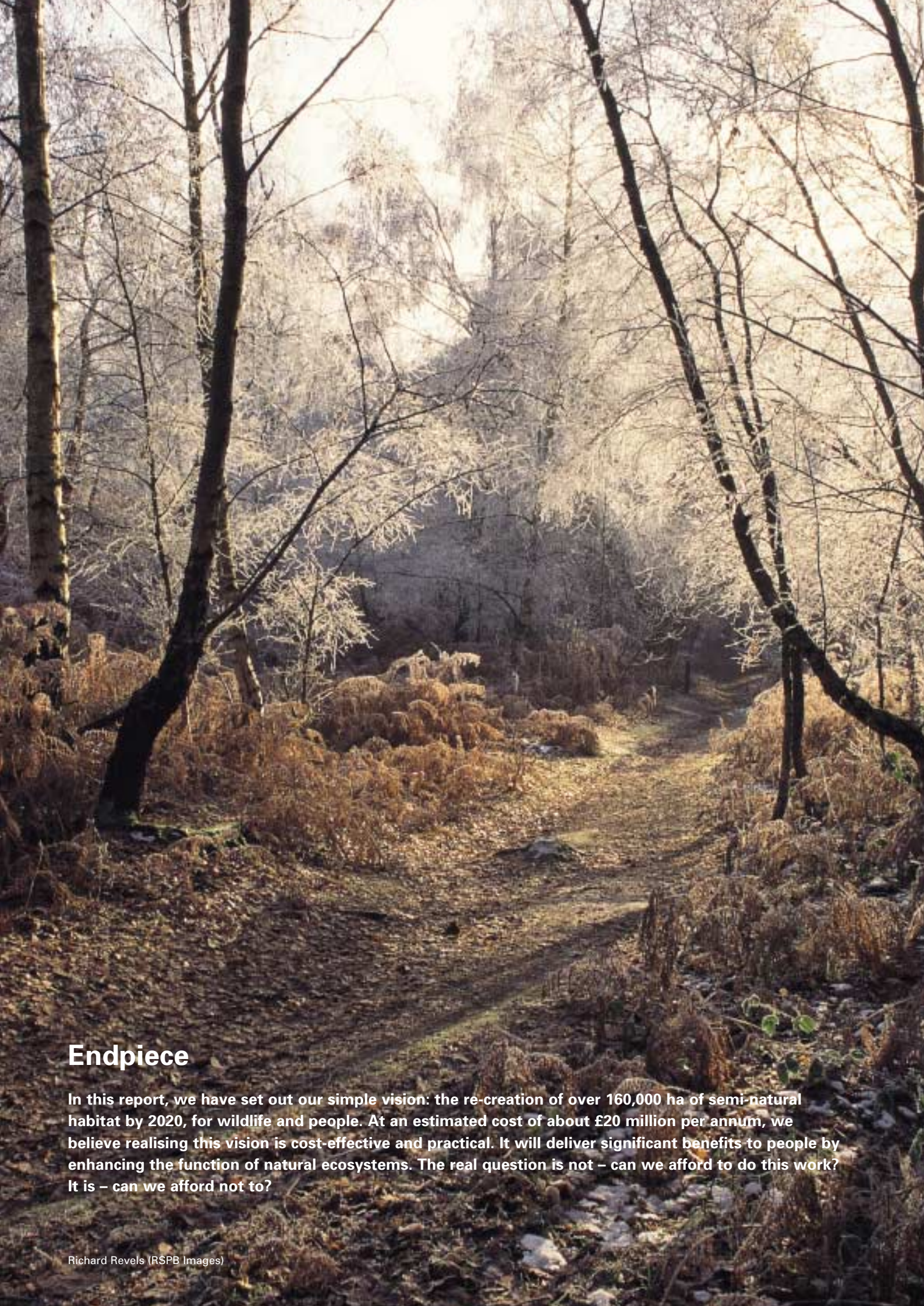
Local government has a key role to play. As well as promoting positive planning, planning authorities must identify, through their

development plans, land that will contribute to priority habitat restoration (including links, corridors and ‘stepping stones’) and relate this to development proposals. Such land should be covered by protection policies to prevent its loss to damaging development.

Habitat restoration work on the ground could be undertaken by a wide range of agencies and individuals:

- Government agencies which manage land, such as the Ministry of Defence
- the Environment Agency
- statutory conservation bodies, for example English Nature
- private companies, such as water authorities
- conservation bodies
- individual landowners and farmers.

Local communities have a vital role through involvement in the design and creation of landscapes which, ultimately, should be of huge benefit to them. The development of habitat restoration proposals must include local communities. This could be achieved by identifying habitat restoration opportunities in their community strategy or plan. Local people may also wish to contribute by volunteering and helping with work on the ground.



Endpiece

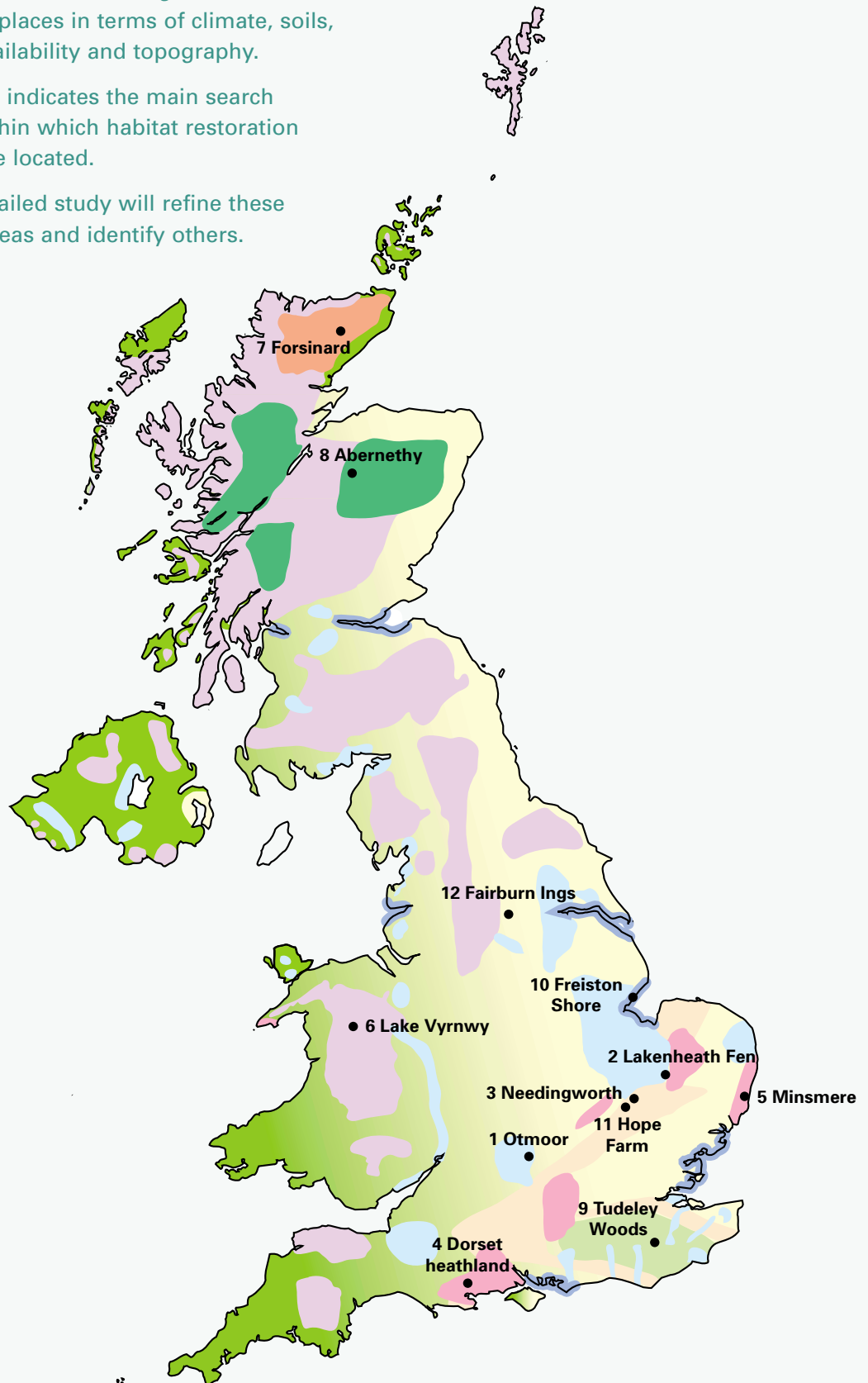
In this report, we have set out our simple vision: the re-creation of over 160,000 ha of semi-natural habitat by 2020, for wildlife and people. At an estimated cost of about £20 million per annum, we believe realising this vision is cost-effective and practical. It will deliver significant benefits to people by enhancing the function of natural ecosystems. The real question is not – can we afford to do this work? It is – can we afford not to?

Appendix 1 Futurescapes: real habitats and places

Habitat cannot be re-created just anywhere: it must be targetted towards the right places in terms of climate, soils, water availability and topography.

This map indicates the main search areas within which habitat restoration should be located.

More detailed study will refine these search areas and identify others.





Saltmarshes and mudflats

Coastal habitats are disappearing because of sea-level rise and climate change. Re-alignment is necessary to create new coastal habitats, and can provide more sustainable defences for the future.



Caledonian pine forest

Expand and link remnant fragments by natural regeneration and planting Scots pine and associated native deciduous species. Restructure and remove exotic species to create forests of native character.



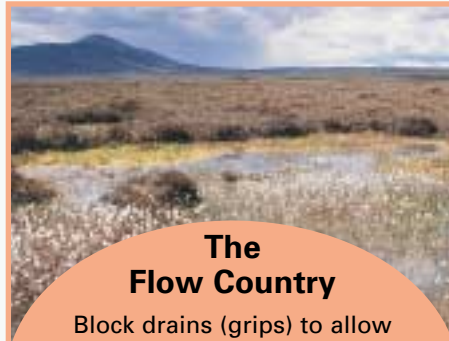
Mountain and heathland

Mainly restore existing habitat rather than re-creating lost habitat. Block drainage ditches (grips) to restore blanket mires and reduce grazing pressure. Encourage small native woods to expand through regeneration and planting along valleys.



Lowland heathland

Link fragments by restoring heaths on suitable soils and removing conifer plantations. Use the planning system to protect land suitable for heath restoration from building development.



The Flow Country

Block drains (grips) to allow active peat growth. Remove specific forestry plantations to create functioning hydrological units.



Downland

Link fragments through re-creation on chalk/limestone soils, mainly through reversion of arable and intensive pastoral grassland.



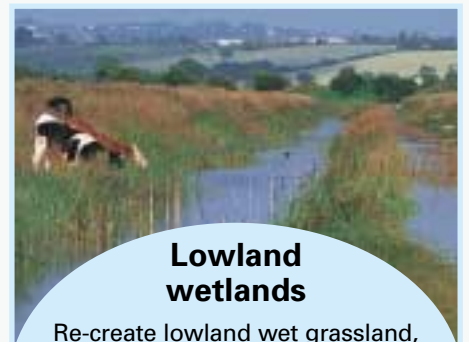
Pastoral

Use pasture of low biodiversity interest to create important habitats, eg heather moorland, native broadleaved and Caledonian pinewoods. Expand ancient and semi-natural woods by adjacent natural regeneration and planting. Re-create small, non-farmed features, eg field boundaries. Reduce the intensity of grassland management, eg reducing drainage and using less fertiliser. Re-introduce low intensity arable crops.



Arable farmland

Expand ancient and semi-natural woods by adjacent natural regeneration and planting. Create other important habitats. Re-create features such as ponds, small woods and field boundaries. Intensify production by creating conservation headlands, reducing use of pesticides/fertilisers and sowing crops in spring, or convert to organic production.



Lowland wetlands

Re-create lowland wet grassland, reedbeds and fens in floodplains and pumped drained catchments. Combine wetland creation and planning: that provides urban flood storage, for flood alleviation projects, and for after-use of mineral working such as gravel pits. (Note that the map shows larger search areas only.)

All photos by Andrew Hay (RSPB Images) except *Coastal habitats* by C H Gomersall (RSPB Images), *Caledonian pine forest* by Steve Austin (RSPB Images), *Lowland heathland* and *Downland* by E A Janes (RSPB Images).

The RSPB's UK headquarters is in Bedfordshire. So, by way of example, let's consider how our vision could be achieved here. Few people would see Bedfordshire as a county rich in biodiversity – although like many places, it has its hidden gems! Many of its characteristic habitats – floodplains, heath, downs and lowland farmland – have been adversely affected by agricultural intensification and specialisation and urbanisation.

But our vision has validity even here – the more so, as urban growth is expected to double the developed area of Bedfordshire from 4% to 8% in the next two decades. Planning at a strategic level is needed to prevent polarisation of town and country.

Gwyn Williams



Bedfordshire's remaining chalk downland is largely restricted to steep slopes where ploughing for arable cropping was difficult. Downland re-creation should be targeted to link these fragments.

River valleys (Ouse, Ivel, Ouzel, Lea, Flitt and Hiz)

Rivers have been much modified by river engineering schemes to alleviate flooding and allow conversion to arable farmland. Few wetlands remain. Potential for floodplain restoration exists, in part to provide flood storage and alleviate flooding of urban areas.

Farmland and small woodlands

Once mixed farmland with small woodlands, Bedfordshire's farmland has become much reduced in landscape and biodiversity value through agricultural intensification and specialisation. More locally, urban growth has also had an impact. Habitat restoration would involve expansion of non-farmed habitats (especially woodland, farm-scale wetlands and field boundaries), protection of valuable features, and extensification of farming (winter stubbles, conservation headlands, grass margins, re-introduction of mixed farming).

Downland

Although reduced through conversion to arable and through development of scrub once grazing ceased, a magnificent area of chalk grassland remains – much of this is now in conservation management. Expanding this resource would enhance the viability of remaining habitat, and provide a landscape asset, access and biodiversity.

Heathland

Bedfordshire's heathlands, associated with greensand soils and once extensive, have been severely reduced. Only 42 ha of heath remain today in four main clusters: heaths around Heath and Reach, Wavendon and Aspley Heaths, areas around Ampthill, and heaths around Sandy. Four of the sites are

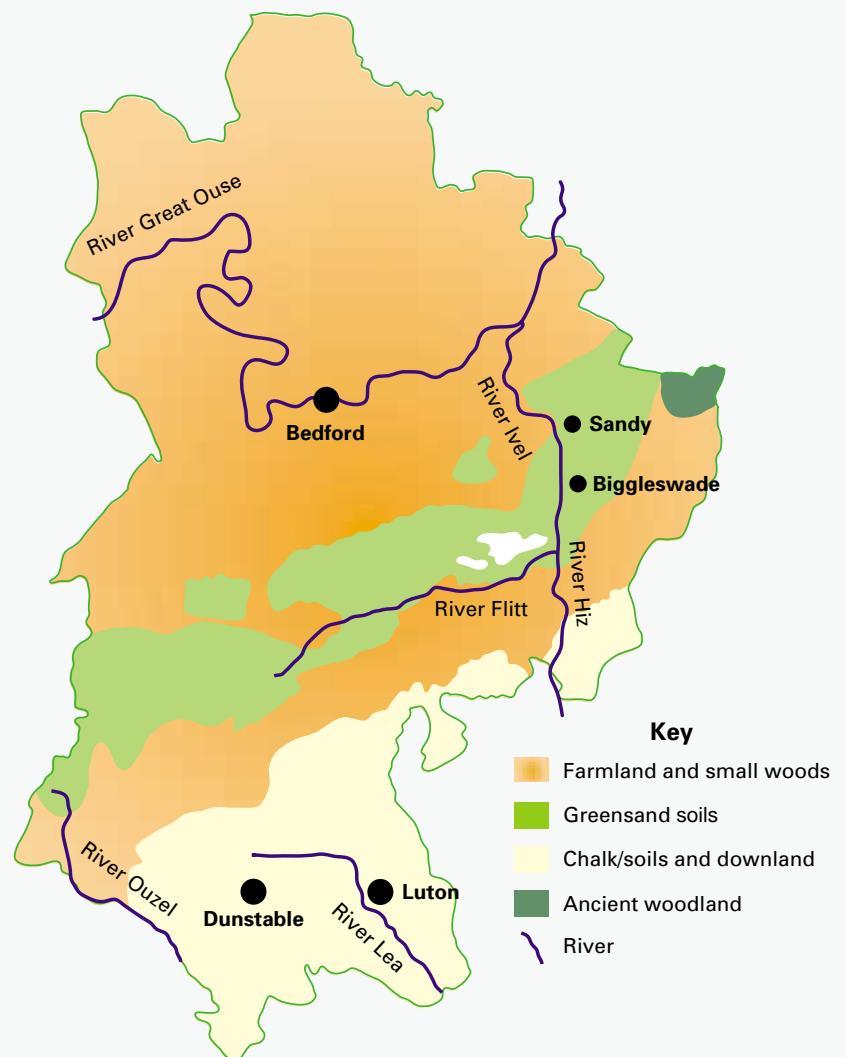


The Lodge, Sandy, where remnant heathland is now being restored and expanded.

managed actively for conservation purposes, the rest are mostly heathland remnants within forestry plantations. Losses were caused by afforestation, conversion to agriculture and urbanisation. The opportunity for re-creation exists – by restoring mineral workings, re-structuring plantations and reverting from arable agriculture.

Woodland

Bedfordshire is now one of the UK's least-wooded counties. Little more than relicts of the ancient broadleaved woods remain. Much was cleared for farmland, and of the remainder, a great deal has been re-planted with conifers. Traditional coppice management had dwindled and died out, but is now being revived in a number of woods – this will benefit a range of species. Woodland re-creation should focus on continuation of existing initiatives such as the Marston Vale Community Forest, as well as expanding from fragments of remnant ancient woodland.



Notes and references

- 1 These maps are reproduced from Surrey County Council and Nature Conservancy Council (1988) *A Strategy for Surrey Heathland*. Rocque's Map of 1762 is reproduced with permission of Surrey County Council. The map of distribution of heathland in 1985 is reproduced with permission of English Nature.
- 2, 3, 4, 5, 6, 7, 8 These figures are taken from the UK Biodiversity Action Plans for the habitats concerned. These can be viewed on www.ukbap.org.uk
- 9 This figure is taken from the Woodland Trust's Position Statement no 12: *Ancient Woodland, October 1999*.
- 10 For details see www.ukbap.org.uk
- 11 The corresponding legislation in Scotland is the Wildlife and Countryside Act 1981, and the Nature Conservation and Amenity Lands (NI) Order 1985 in Northern Ireland.
- 12 *Access to Other Open Countryside: Measuring Potential Demand*. Countryside Agency, 1999.
- 13 The RSPB (2000) *Valuing Norfolk's Coast*. The RSPB, Norwich.
- 14 Gallop poll commissioned by EMAP Pursuit Publications 1986.
- 15 Further information is given in leaflet the *New rights, new responsibilities. What the new countryside access arrangement will mean to you*. The Countryside Agency (2001). Available from the Countryside Agency, or see www.countryside.gov.uk
- 16 As acknowledged by the statutory agencies for biodiversity and public enjoyment of the countryside. See, for example, paragraph 3.3 in Countryside Agency, Countryside Council for Wales, English Nature, Environment Agency and Forestry Commission (2000) *Improving access to woods, watersides and the coast*. A joint report to Government on the options for change. Countryside Agency.
- 17 de Winton T and Robins M (1999) *An Environmental Prospectus for South West England: Linking the Economy and the Environment*. Published by the Environment Agency and the RSPB for the SW Environment Prospectus Group.
- 18 Rayment, M (1997) *Working with Nature in Britain: Case Studies of Nature Conservation, Employment and Local Economies*. The RSPB, Sandy.
- 19 We acknowledge Dr William Bird's provision of these statistics, originally in his presentation *Walking to Health* to a Countryside Commission conference held in December 1998: *Countryside Access: An integrated approach*.
- 20 DETR (1999) *Quality of Life Counts. Indicators for a strategy for sustainable development for the United Kingdom: a baseline assessment*. Government Statistical Service. Also see www.detr.gov.uk
- 21 National Rivers Authority (1995) *A guide to the understanding and management of saltmarshes*. R&D Note 324. NRA, Bristol.
- 22 The RSPB (2000) *Seas of Change. An evaluation of potential sites for intertidal habitat creation*. The RSPB, Sandy.



Restoring habitats can help us restore ourselves. American research has demonstrated that walking in the natural environment increases our mental restoration more significantly than walking in the city or relaxing at home. The quality of the countryside and the quality of our lives may be more closely linked than many of us imagined.

Young volunteers
at work – RSPB
Leighton Moss
nature reserve,
Lancashire.



Geoff Harris (RSPB Images)



The RSPB works for a healthy environment rich in birds and wildlife. It depends on the support and generosity of others to make a difference. It works with bird and habitat conservation organisations in a global partnership called BirdLife International.

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