

Scotland's Biodiversity

It's In Your Hands



A strategy for the conservation and enhancement
of biodiversity in Scotland



SCOTTISH EXECUTIVE

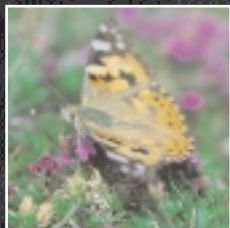
Our Vision

It's 2030: Scotland is recognised as a world leader in biodiversity conservation. Everyone is involved; everyone benefits. The nation is enriched.

Our Aim

To conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland now and in the future

Our Objectives



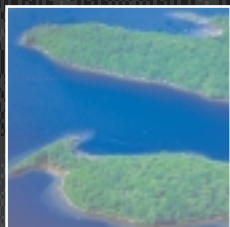
Species and Habitats

To halt the loss of biodiversity and continue to reverse previous losses through targeted action for species and habitats



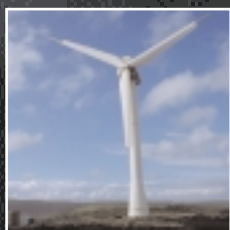
People

To increase awareness, understanding and enjoyment of biodiversity, and engage many more people in conservation and enhancement



Landscapes and Ecosystems

To restore and enhance biodiversity in all our urban, rural and marine environments through better planning, design and practice



Integration and Co-ordination

To develop an effective management framework that ensures biodiversity is taken into account in all decision making



Knowledge

To ensure that the best new and existing knowledge on biodiversity is available to all policy makers and practitioners



Outcomes 2030

This 25 year strategy sets out to realise a bold vision. Once this vision has been turned into a reality, a lot will have been changed and improved.

The following outcomes describe how we will approach biodiversity conservation and enhancement in Scotland in 2030.



Species and Habitats

Outcome 2030

The loss of priority species and habitats has been halted, and many priority species and habitats are increasing in both numbers and range. The overall balance is positive. Comprehensive monitoring systems are in place to enable accurate assessment of the state of our biodiversity. Where decline continues, the reasons are understood, and measures are in place to minimise losses. The genetic diversity within species is better understood and actions to conserve this diversity for priority species are in place. The spread of invasive non-native species has been slowed or halted, and specific areas, regions or islands are designated as free from some invasive and non-native species. Rare and specifically 'Scottish' varieties of domestic plants and animals have been catalogued and more effectively conserved.

Wider countryside measures ensure that further species are not joining the priority list, although there is recognition that some changes due to climate change are inevitable and irreversible.



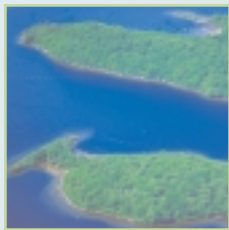
People

Outcome 2030

A sense of responsibility for and stewardship of biodiversity is a core value in Scottish culture, and particularly for all users and managers of land and water. Corporate responsibility reporting is widespread among businesses and includes reporting on environmental and biodiversity issues and appropriate best practice.

More people understand and enjoy the social, economic and environmental benefits of biodiversity. All those who work directly with nature and natural resources – farmers, foresters, gamekeepers, fishermen, fish farmers, gardeners, civil engineers, architects, land, park and open space managers and designers – have increased awareness and understanding of biodiversity issues, are better able to identify and motivated to develop opportunities for biodiversity enhancement, and have become more engaged in advising on the best ways forward.

Children and adults experience more firsthand learning about biodiversity in the open spaces around them, and reinforce the demand for action at all levels to enrich biodiversity in parks and golf courses, sports fields, transport corridors, green and brown-field sites. Many more people recognise and enjoy the complexity and beauty of their environment and take steps, through actions small and great in their daily lives, to conserve and enhance it.



Landscapes and Ecosystems

Outcome 2030

Scotland's landscapes are attractive and diverse; and terrestrial and marine ecosystems are healthy, productive, and rich in biodiversity. Planning is more strategic and more integrated, taking full account of the complex relationships between different elements and activities in landscapes, seascapes and ecosystems, in both time and space.

The overall pattern of land and water use, in both rural and urban environments, supports a rich and varied array of wildlife. Organisms can move, feed, reproduce and disperse effectively, and are better able to adapt to changing circumstances of land use and climate change. Farmland, urban green-space, transport corridors, gardens – and indeed all 'managed' environments including coastal and marine – have become richer in wildlife through widespread improvements in design and practice.



Integration and Co-ordination

Outcome 2030

Biodiversity – and Local Biodiversity Action Plans – are taken into account in all significant development programmes and grant schemes; and in policy, planning, design and development decisions taken by government and business. Local Biodiversity Action Plans are better co-ordinated with each other and with national biodiversity objectives, and they are more effectively communicated to relevant decision makers and practitioners.

Incentives are in place at all levels to encourage biodiversity conservation and enhancement and to include biodiversity as a routine component in best practice. Environmental assessment procedures specifically address biodiversity issues, including cumulative impact. This strategy and its associated implementation plans have become a major force for the successful integration, facilitation, co-ordination and promotion of biodiversity action.

Analysis of monitoring data reveals trends and issues requiring action across different arms of government. Mechanisms are in place to initiate and co-ordinate such action.



Knowledge

Outcome 2030

Anyone who wishes to learn more about Scotland's biodiversity in general, or in relation to specific issues or opportunities, has ready access to stimulating and appropriate information.

School children, students, researchers and the general public are able to draw on a growing and accessible resource of information on the value and state of Scotland's biodiversity, and practical ways to enhance biodiversity at all levels from gardens to landscapes. More specific, high quality information and advice on best practice are available, tailored to the needs of different sectors and levels of decision makers. Simple access gateways and search systems have been developed to bring together the numerous sources of biodiversity information.

Biodiversity advice is consistent, realistic and accessible. We understand better the contribution of biodiversity to health and quality of life, and the social and economic values of biodiversity more generally. Critical gaps in our knowledge are reviewed regularly by a wide range of stakeholders. Cost-effective and co-ordinated research is undertaken as required.

A black and white photograph of a person wearing a kilt, holding a clump of soil in their hands. The person's face is partially visible in the background, looking down at the soil. The image is used as a background for the title and subtitle.

Scotland's Biodiversity

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A strategy for the conservation and enhancement
of biodiversity in Scotland

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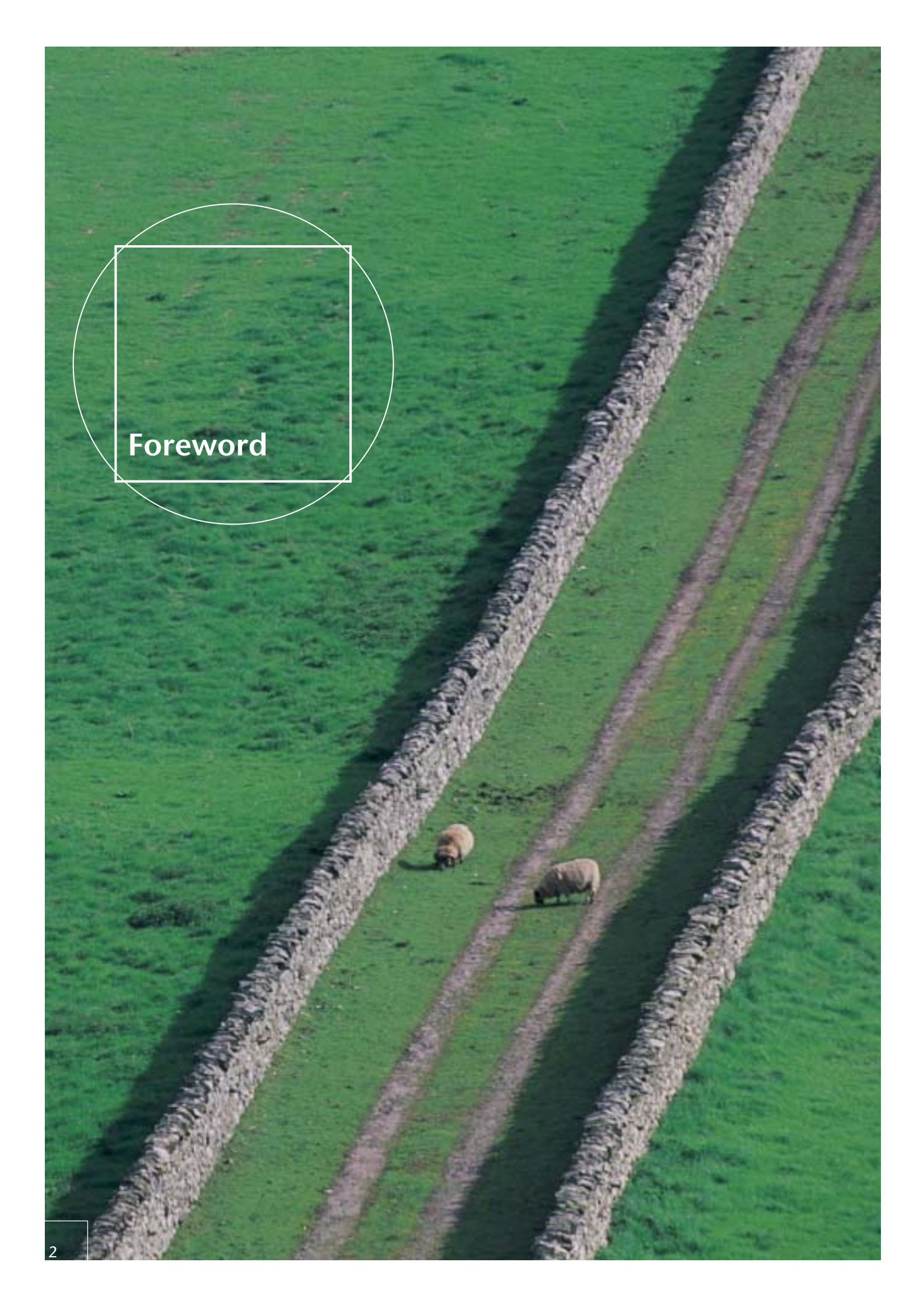
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An aerial photograph of a lush green field. Two parallel stone walls run diagonally from the bottom left towards the top right. Between the walls, there are two sheep grazing. The field is vibrant green, and the stone walls are made of grey, rough-hewn stones. Long shadows are cast by the walls and the sheep, indicating a low sun position.

Foreword

Foreword

“Scotland’s Biodiversity: It’s In Your Hands” is a landmark strategy for Scotland. It sets out a vision for the future health of our biodiversity, and maps out a 25 year framework for action to conserve and enhance biodiversity for the health, enjoyment and well-being of all the people of Scotland.



Biodiversity means the variety of life around us - life of all kinds, from the largest animal to the smallest plant. In Scotland, biodiversity has always been fundamental to our lives. Scotland’s biodiversity is part of our heritage. Our landscapes, and the plants and creatures that make and live in them, are recognised around the world and have underpinned our lives.

But we have also had a profound impact upon our natural heritage, and in recent years we have become far more conscious of that impact. From Rio, through the UK Biodiversity Action Plan, to the Johannesburg Summit, important steps have been taken along the road of recognising the need for co-ordinated action to safeguard our planet’s irreplaceable natural heritage. This Strategy will guide that action in Scotland over the next 25 years.

A key theme of the Strategy is to raise public consciousness and reinforce the link between people and biodiversity - the need for people to appreciate, understand, protect, enjoy and above all else conserve Scotland’s biodiversity. I want this Strategy to help us re-establish and strengthen the relationship between the people of Scotland and their natural world. Alongside the Nature Conservation Bill, which I anticipate will come into force later this year, the Strategy will give Scotland a new and integrated system of nature conservation.

The Strategy owes a huge debt to the members of the Scottish Biodiversity Forum. Its development has been a model of cooperation and shared vision between government, the private and public sectors, non-governmental bodies and individual members of the public. I acknowledge with gratitude everyone who has contributed to this work and has helped us produce a Strategy that does justice to Scotland and its priceless biodiversity.

I believe the Strategy will place Scotland at the forefront of international biodiversity conservation. I hope that it will be widely read and that all who read it will find it relevant to their daily lives. The task now is to turn the vision of the Strategy into action that makes a difference. No one of us can do this on our own. It is a shared challenge for each and every one of us - Scotland’s biodiversity is in all our hands and it is our collective duty to conserve it for future generations.

A handwritten signature in black ink, appearing to read 'Allan Wilson', with a stylized flourish at the end.

Allan Wilson
Deputy Minister for Environment and Rural
Development



Preface

Preface

Biodiversity is simply the variety of life. It represents a new appreciation of nature, with the emphasis on the incredible diversity of varieties, species, habitats and ecosystems that exist all around us, and on their value to humans”.¹

This document presents a 25 year strategy to conserve and enhance biodiversity in Scotland.

It is supported by many other documents and initiatives. The most critical of these are the implementation plans which have been produced to address the following key themes:

- cross cutting issues
- interpretation, communication and education
- urban biodiversity
- rural biodiversity
- marine biodiversity
- local delivery

The strategy presents a vision, aim, objectives and broad directions for action, while the implementation plans are the mechanism for prioritising action and delivering the aim and our objectives. The implementation plans will take full account of changing circumstances through time and will be updated every three years.

A Report on Indicators also supports the Strategy. This report aims to facilitate measurement and reporting of progress towards achieving the five strategic objectives of this strategy.

“This concept of biodiversity embraces all living things, from the tiniest garden ant to the Caledonian granny pine. Biodiversity is everywhere, in window box and wildwood, in roadside and rainforest, in snowfield and seaside and sky.

It is part of the natural heritage we have all inherited. In Scotland we have a bountiful share of this richness; but we must not take it for granted. We depend on biodiversity for our quality of life. What we don’t save now, our children and grandchildren will have to pay for later.”

Magnus Magnusson KBE



Green Veined White Butterfly on Melancholy Thistle, Tayside

¹ A more formal definition from the Convention on Biological Diversity: "Biological diversity" means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

The need for a strategy

We need a strategy to ensure that biodiversity is conserved for the sake of our economy and future generations. Biodiversity conservation is an important dimension of sustainable development and a key measure of our success in achieving it.

We also need the strategy to ensure we meet our international obligations. The Convention on Biological Diversity is a 1992 United Nations agreement, to which the UK is a signatory, which commits us to *“the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilisation of genetic resources”*. To take forward the Convention, the European Union has set an objective in the 6th EU Environmental Action Programme *“to protect and restore the functioning of natural systems and to halt the loss of biodiversity in the European Union”* by 2010. It is vital that we play our part in Scotland in meeting that commitment.

Biodiversity is a key indicator of success in achieving sustainable development.

Sustainable development is defined as: *“development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”*

World Commission on Environment and Development (Brundtland Commission) (1987)

More specifically, we need a strategy to ensure that we overcome the problems and develop the opportunities relating to biodiversity which were identified in the many supporting documents that led to this strategy – and which we summarise in section 3.



Bee nectaring

A lot is already happening. The UK Biodiversity Action Plan process has helped identify clear targets and actions for priority species and habitats, and the work of environmental non-governmental organisations and statutory bodies has delivered many important success stories for biodiversity and the engagement of many more people. But current approaches to the conservation of biodiversity are not as comprehensive or as well informed as we would like. Much of the emphasis has been on conserving individual sites or species. While this is a vital component of any strategy, we need to reinforce and underpin this work by addressing the bigger picture: the dynamic landscapes and patterns of land and water use, the ways we can influence these to support and enhance biodiversity on the broad scale, and how we can relate actions for biodiversity to people's everyday experiences and economic wellbeing.

So we need a strategy to help us make these big connections. We need it to get more people engaged; to make biodiversity mean something to everyone; to strengthen existing measures and management systems for our natural heritage; to promote integration and co-ordination; to enhance management of our landscapes and ecosystems; and to promote more informed decision making.

What's in the strategy?

We present **our vision** for the future of biodiversity in Scotland in section 1. The vision is broad, as it must be for a 25 year strategy in a rapidly changing world.

In section 2 we explore **biodiversity in Scotland**: its value and importance, its current state, and the major factors which influence it.

In section 3 we explore **the issues and opportunities**: what it is we are trying to achieve, the issues we need to address and the kinds of action that need to be taken if we are to succeed.

In section 4 we explore where we hope to be in 25 years time – the desired **outcomes** in relation to each of our five strategic **objectives**, and the **actions** required to deliver these outcomes.

In section 5 we set down the broad mechanisms for **delivery** of the strategy. We highlight the particular opportunities and responsibilities for different agents and stakeholders, and the ways in which the implementation of the strategy will be steered and coordinated.

In Section 6 we consider the processes and the timeframes for **reviewing progress** and refining the implementation plans towards the vision set out in this strategy.



Female eider duck on nest, Isle of May

What's not in it

Taken alone, this document cannot do justice to the scope and value of Scotland's biodiversity and the complexity of the issues associated with its conservation and enhancement, nor to the vast amount of work which lies behind this strategy, and indeed behind current action for biodiversity in Scotland. A range of material is available which addresses these issues in more detail, but much of it is summarised in a set of documents produced by the Scottish Biodiversity Forum and the Scottish Executive. These documents include:

1. The UK Biodiversity Action Plan (1994)
2. Biodiversity in Scotland: the way forward (Scottish Biodiversity Group 1997)
3. Action for Scotland's Biodiversity (Scottish Executive 2000)
4. Flying Start (Scottish Biodiversity Group 2001)
5. Biodiversity in Scotland: progress report (Scottish Executive 2002)
6. Towards a Strategy for Scotland's Biodiversity (Scottish Biodiversity Forum 2003):
 - Biodiversity Matters!
 - Scotland's Biodiversity Resource and Trends
 - Candidate indicators of the state of Scotland's biodiversity
 - Summary of responses to public consultation
7. Scottish Biodiversity Forum Research Strategy

Also of particular relevance is "Meeting the Needs...Priorities, Actions and Targets for Sustainable Development in Scotland" (Scottish Executive 2002).

And who is it for?

It is essential that decision makers at all levels in government and the public sector read this strategy – and help to realise its vision. Government and public bodies have a responsibility under the anticipated Nature Conservation (Scotland) Act 2004 to further biodiversity, and this strategy in particular. The strategy should, however, be seen as **a way in** to biodiversity conservation and enhancement rather than the ‘answer’ in itself.

The strategy is also for the people of Scotland. It addresses issues relevant to farmers and land managers, fishermen and fish farmers, transport companies and utility providers, and businesses – both large and small. Indeed, this strategy makes it clear that everyone in Scotland has a role to play in the future of biodiversity conservation and enhancement.



Fly Agaric fungus, Birch Woodland, Rannoch

Key reference resources

Many useful reference documents can be accessed direct from the websites of the Scottish Executive, Scottish Biodiversity Forum and UK Biodiversity Action Plan.

www.scotland.gov.uk/publications

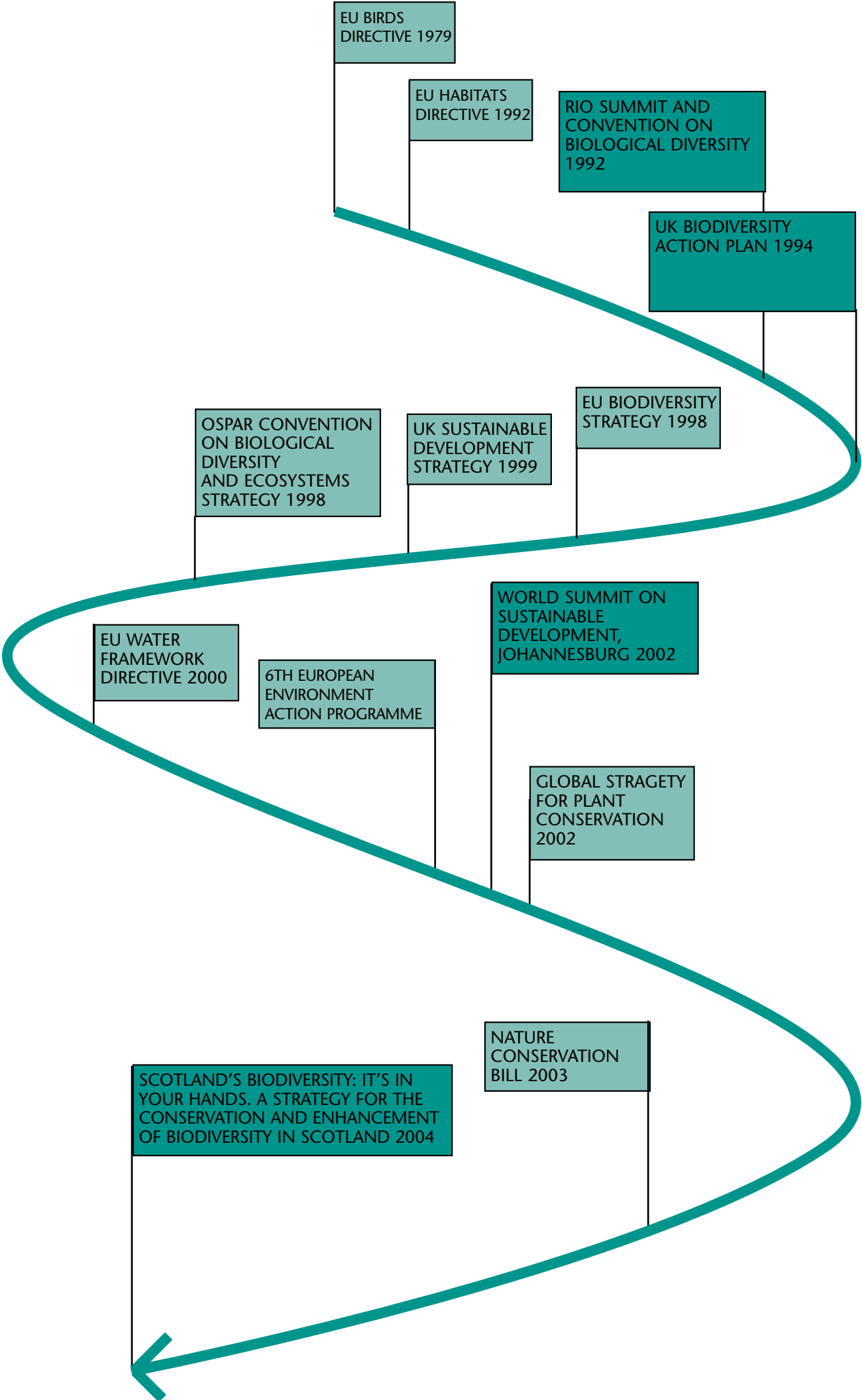
www.scotland.gov.uk/biodiversity

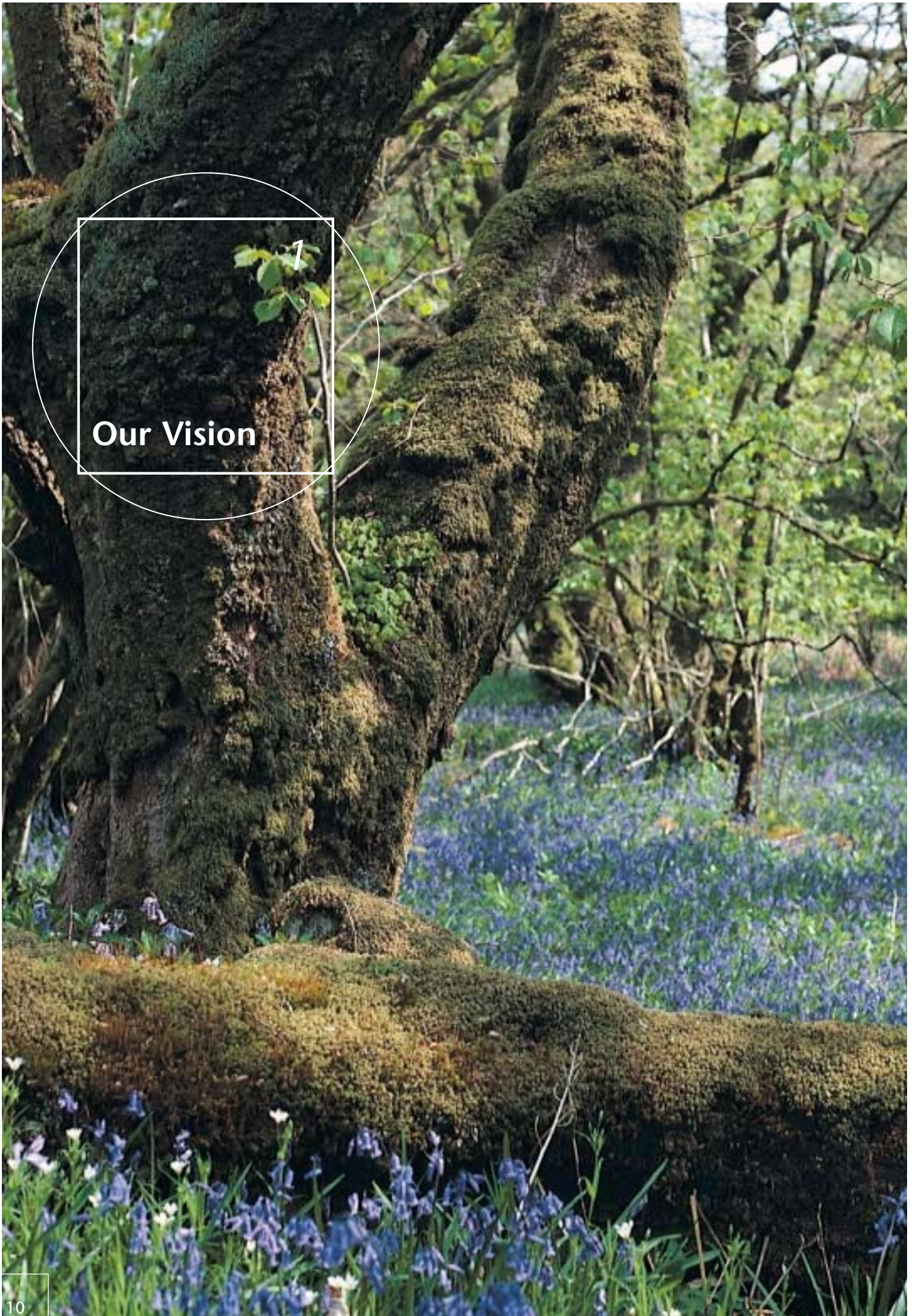
www.ukbap.org.uk

Also see

www.sustainable-development.gov.uk/eac-wssd/progress.htm

Major Biodiversity Milestones





Our Vision

1

1. Our Vision

It's 2030: Scotland is recognised as a world leader in biodiversity conservation. Everyone is involved; everyone benefits. The nation is enriched.



View south across Loch Insh.

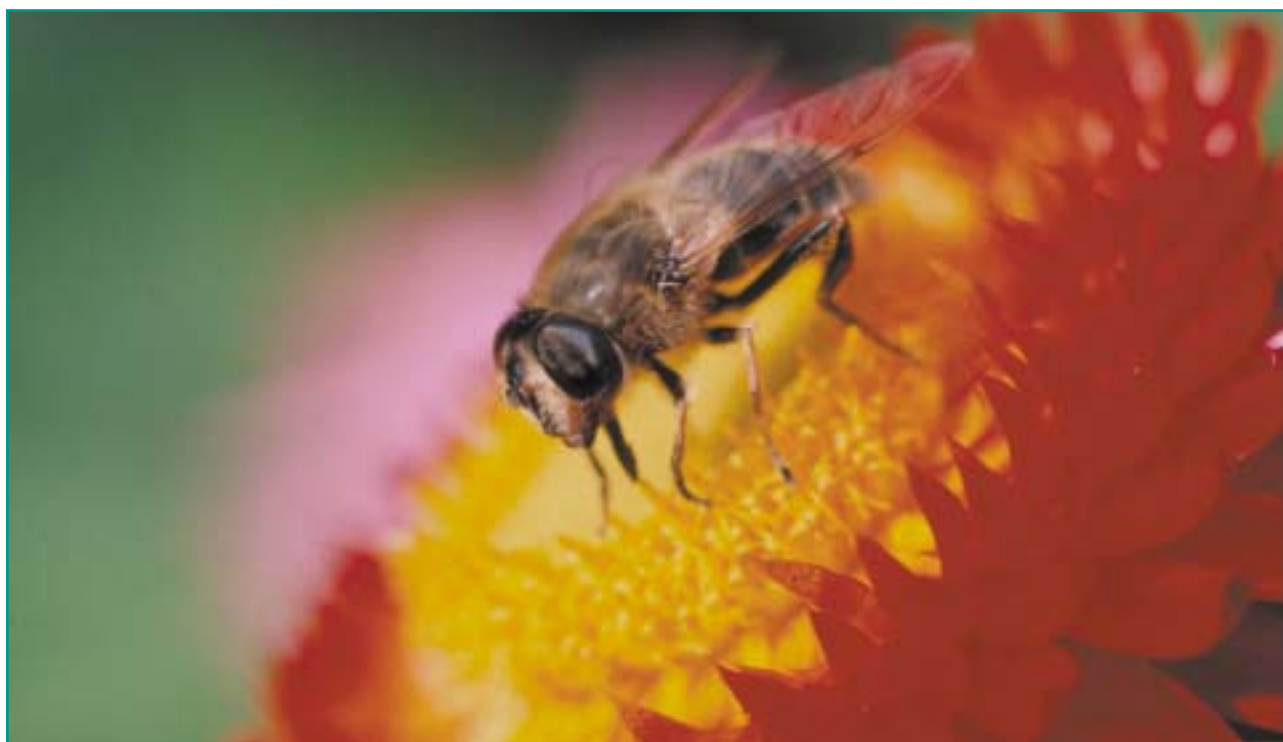
Let's start in your garden

"The garden is a miracle. Every year I let a bit go wild just for the pleasure of seeing the nature struggling away to get itself sorted. The roses look bonny, but it's the thistles that bring the goldfinches."

Davy Macdonald, retired postman, Kiltarlity

Gardens are a haven for wildlife, and their importance has increased as wildlife in the wider countryside has declined. Most gardens can be improved to support greater biodiversity through small changes in design, planting and management, for example by planting a native tree, creating a nectar rich border, a garden pond, or a meadow.

One garden may seem trivial, and it may be if seen in isolation, but if many people do the same, and if public spaces are better managed for biodiversity, then networks will spring up, our actions will reinforce each other, and biodiversity will flourish.



Hover-fly nectaring

The future in fragments

Butterflies have a story to tell us about fragmented habitats. Some butterflies species are increasing in numbers, but these are mainly the 'generalists', such as the peacock butterfly which can survive in a range of different habitats. Many of our rarer species, like the marsh and pearl bordered fritillaries are in decline, and these are typically the 'specialists' which are highly dependent on particular plants or habitats. And it is because these habitats are now so fragmented that the specialists – and a host of other organisms – find it increasingly difficult to reproduce and survive. We need to expand and link up these critical habitats or we risk losing much precious biodiversity.

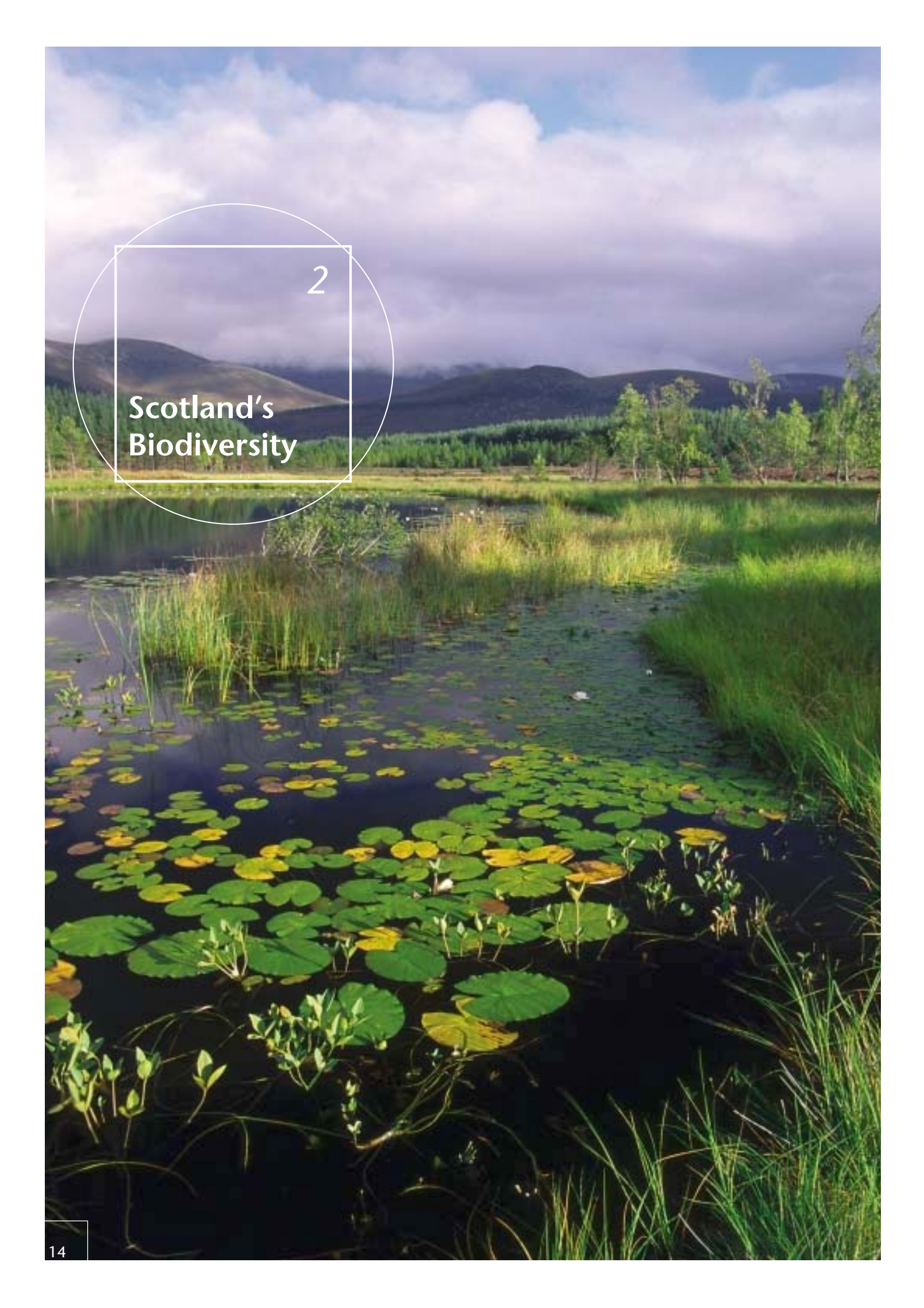
Our impact can be positive

In the Western Isles, a form of sandy grassland known as 'the machair' provides a world class habitat that is renowned for its swathes of summer flowers and breeding birds such as redshank, ringed plover, dunlin and corncrake.

What's really surprising though is that the machair is, in part, created by human activity. While the richness and diversity is the product of natural gradients of salinity, acidity and water level, it is the crofting pattern of land use – cattle and sheep grazing, small scale cultivation and land use rotation – that ensures the machair does not revert to a simpler and much less rich habitat.



Red Clover carpeted Machair, Isle of Lewis

A scenic landscape photograph of a pond. The foreground is filled with numerous green lily pads floating on the water, some showing signs of aging or damage. Tall reeds and grasses grow along the edges of the pond. In the background, there are rolling green hills and mountains under a sky with soft, white clouds. The overall atmosphere is peaceful and natural.

2

Scotland's Biodiversity

2. Scotland's Biodiversity

In this section we explore the nature and value of biodiversity in Scotland. We also consider the state of our biodiversity, and look briefly at some factors which underpin habitat and species diversity, and the possible effects of climate change.

2.1 The nature of Scotland's biodiversity

Scotland is special. Not so much for the sheer number of species that live here (though we do have around 90,000) but rather for the mosaic of habitats and scenery which make up such a complex and varied landscape.

Scotland is a crossroads – of climatic zones and ocean currents, of arctic and temperate species. Weather systems typically build from the south west, bringing us relatively warm and wet weather, especially in the west; and this is complemented by the tempering influence of the Gulf Stream. But Arctic air frequently pushes back westwards to bring the cold crisp days of winter and cool spring sunshine. Arctic currents push into the North Sea from time to time, reinforcing the distinct climates of east and west.

This climatic variation is complemented by a great range of geology, landforms and nature. The physical landscape throws up a tremendous variety of coastline, islands and undersea formations; glens, mountains and plateaux; rivers, lochs and floodplains. And in each and every one of these environments, from seabed to summit, nature has woven a rich tapestry alive with myriad species of plants and mammals, bacteria and birds, fungi and fish, reptiles, amphibians and invertebrates.

Then, over all of this, mankind has transformed the detail of the landscape and the dominant vegetation down through millennia.

Our national and international assets

In all, Scotland has 65 out of the total 159 conservation priority habitats listed in the European Habitats Directive. And because of the variation in climate and landform, many species in Scotland find themselves at the extreme of their range or living in atypical habitats, where they have adapted as local varieties.

Our country is internationally important for its heather moorland, its upland blanket bog and lowland raised bog, for its machair, and for its freshwater and seawater lochs. Some of our mountain summits are akin to Arctic tundra, while on the west coast there is our 'temperate rainforest'.

Our latitude, coastline and pastures combine to create an internationally important habitat for migratory waders and wildfowl. Our rich seas support 244 species of fish, amazing populations of seabirds, and a range of fascinating mammals: seals, whales and dolphins. And throughout all these habitats live some 25,000 largely unknown invertebrates.

The eagle, deer, salmon, grouse, grey seal, capercaillie, Scots Pine, red squirrel, heather and thistle, to name but a few, are all enduring symbols of Scottish culture and enterprise. Biodiversity lies at the heart of the Scottish identity.



White-tailed eagle.
Adult seizing fish from sea.

Some 90,000 species ...and still counting

At one end of the scale we have at least 40,000 species of virus, bacteria and protozoa, some 24,800 species of invertebrates, and 20,000 different plants and fungi. At a more comprehensible level, we also have 242 species of birds, 63 different mammals and ten species of reptiles and amphibians.



Young frog on teasel leaf

A rainforest close to home

On the west coast of Scotland and on some of the larger islands grow ancient oceanic woodlands – so rich in species that these forests has been likened to that of temperate rainforest. Oak, birch, bird cherry, rowan, alder and many other familiar trees grow in these woods. But what is truly remarkable is the variety of mosses, liverworts and lichens which thrive in the moist, stable oceanic climate and the unpolluted air.

A coral reef to call our own

In the deep waters to the west and north off Scotland are corals, growing on the seabed, in some cases in large reef-like colonies. The main species involved, *Lophelia pertusa*, is as beautiful and remarkable as many of its tropical relatives, and colonies support more than 800 animal species. Even more remarkable, it is thought to grow in water up to 3,000m deep. These reefs were being rapidly destroyed by deep water fishing trawls until fisheries control measures were introduced in 2003 to protect them.



Maerl Bed, West of Wyre Skerries, Wyre Sound

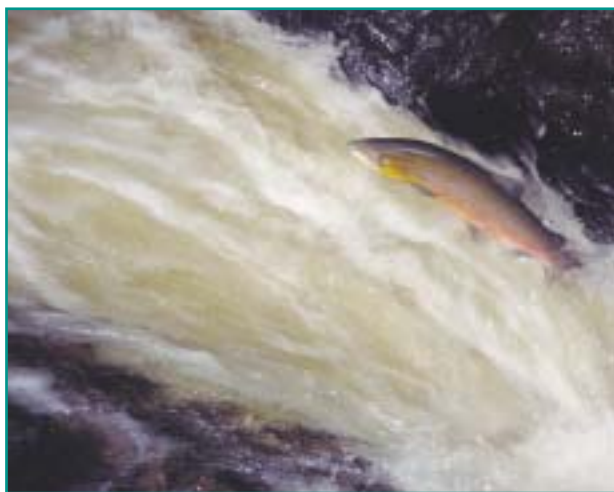
The secret life of seaweed

In the clear waters around many of our west coast and islands can be found a rich and unusual habitat – several species of calcareous red seaweed growing on the seabed.

European maerl supports over 1,700 animal species and 300 seaweed species. A recent study of Scottish maerl beds found species previously unknown to science.

2.2 The value of Scotland's biodiversity

Biodiversity has always been a source of wealth and a stimulus to culture and enterprise in Scotland. Ours is a land renowned worldwide for its clean air, clean water, wilderness areas and seascapes, and for the biodiversity associated with these natural attributes.



Atlantic salmon leaping up a waterfall on the River Almond

Our nation has been built on its biodiversity. Herring, cod, haddock, and salmon were critical to the development of our economy, our seagoing skills, our infrastructure, and the nutrition of our growing industrial cities.

Forests and forest products formed the basis of shipbuilding, and the economies and trade associated with it. Deer and grouse underpin the economy of huge swathes of the uplands. While, in farming, where much of the genetic biodiversity is influenced by man, we have domesticated breeds or varieties – of both crops and livestock – which are renowned worldwide.

Our dramatic landscapes and seascapes, and the biodiversity they host, also underpin the tourism industry which employs more than 9% of the Scottish workforce and contributes more than £4.5 billion to our national economy. In addition, economic growth in some scenic areas of north and west Scotland is closely linked to the quality of life associated with this environment, and the value that many people place on this.

Likewise, people who live in urban environments are increasingly realising that the green spaces around them are important. They add texture to life; provide opportunities for outdoor activity and healthy living; and provide a platform for learning.

The nation's health and wealth

Biodiversity is important for our health – individually and as a nation. Fully functioning ecosystems provide us with healthy and productive environments which support the economy of rural and coastal areas. Bacterial biodiversity gives us productive soils and clean water. Without our forests, bogs and the plankton in the sea, the greenhouse effect would be even more serious.

There are also many practical applications of biodiversity. People forget that the first antibiotics came from a simple mould – discovered by a Scot. And there are literally thousands of other Scottish plants, fungi, bacteria, plankton and fish which have, or could have, applications in medicine, healthy eating, pest management and a whole host of other important products and areas.

Biodiversity is not just beautiful and fascinating, it is an investment for the future. Our fisheries show what can happen when we don't get the management right.

So what's biodiversity worth?

Many people have tried to put a cash value on biodiversity, but it is an exercise fraught with difficulty. Different analysts provide different estimates, but the figures for existing values are always high, and for potential value, almost infinite. But more importantly, the cost of losing any significant part of our biodiversity cannot be calculated – and may be enormous. A small loss may seem unimportant, but lots of little losses soon add up to a substantial loss; a loss that would deny future generations a wealth of cultural, scientific and commercial opportunities; and in the extreme, a loss may threaten the very stability of our ecosystems, and the quality of our soil, water and air.

The value of our plants

Flora Celtica is an international project based at the Royal Botanic Garden, Edinburgh, documenting and promoting the knowledge and sustainable use of native plants in the Celtic countries of Europe. For example, its records tell us how bog myrtle, a distinctive shrubby plant of moorlands, has traditionally been used to flavour and preserve beer, as a garnish for food, and as an insect repellent. Indeed, in 1995, a commercial repellent for midges based on bog myrtle was produced on Skye under the trade name *Myrica*.

The value of wildlife tourism

Wildlife tourism is growing in popularity and now generates substantial income for the economy, especially in more remote parts of Scotland. Whale and dolphin watching generates around £3.4 million per year; visiting osprey sites generates around £1.7 million; and a long established recreation – angling on the Tweed – generates £12.5 million. The total generated by all forms of wildlife-related tourism, and its contribution to mainstream tourism will be far higher.



Interpretation Board, Vane Farm RSPB Reserve

Greenspace Scotland

Greenspace comprises between 10% and 40% of the area of the major Scottish towns and cities. This is a huge resource, potentially rich in biodiversity, which is close to the majority of the people in the country. There are tremendous opportunities to combine increased biodiversity with better access, learning facilities and promote healthy living more generally.

2.3 The state of Scotland's biodiversity

We may not have control over many of the factors affecting our biodiversity – climate, ocean currents, rocks and the basic physical structure – but people have been a major force in shaping our landscape and biodiversity for thousands of years and our influence continues. While some of our activities have benefited biodiversity, many have resulted in declines. Some of these declines are now slowing or being reversed, but much of our biodiversity is still under threat.



Forestry, Craigmore Wood viewed from Dulnain Bridge

The main changes in biodiversity experienced in Scotland relate to the felling of ancient forest, the grazing of sheep and deer, the intensification of agriculture and commercial fishing, the planting of non-native conifers, the spread of urban development, the introduction of fish farming, and the increase in pollution.

Measuring the impact of these changes is difficult. Clearly it is an impossible task to

monitor the status of all 90,000 plus species, so the data we have is by nature very selective. Nonetheless some major trends can be recognised, and many species serve as indicators of broader change.

Some of our rarest species and habitats are continuing to decline in status, a few are beginning to recover, thanks to conservation action and investment; but half show no sign of significant improvement, despite our efforts so far.

Good news and bad news

The summary below gives a very brief and necessarily selective overview of some key trends. A more comprehensive analysis was made in: *Towards a Strategy for Scotland's Biodiversity: Scotland's Biodiversity Resource and Trends*. Scottish Biodiversity Forum, Scottish Executive 2003.

Marine and freshwater environments

After a long period of decline, the quality of water in our rivers and lochs has improved, related to the decline of heavy industry along with better effluent regulation and sewage treatment. The loss of the otter in the lowlands has been reversed, suggesting that some fish and crustaceans have also returned. These improvements are encouraging. Nevertheless, further conservation efforts are required for many freshwater species. For example, the freshwater pearl mussel, of which we hold 50% of the world's population, continues to decline. In fact, in 2000, some fifty percent of native freshwater species were thought to have declined throughout Scotland. The extinction of the Scottish population of the vendace – a freshwater fish – in 1980 illustrates what can happen if we fail to take appropriate action in time.



Otter on riverbank

The quality of our coastal waters has generally improved in recent years, again benefiting from better sewage treatment and stricter regulation of industrial effluents, coupled with a decline in industrial activity. Related to this, the Clyde and Forth are again showing a greater diversity of invertebrates and fish. Many seabird populations in Scotland have also increased, but some species such as the cormorant, kittiwake and roseate tern have shown marked declines. This mixture of positive and negative is typical of the trends we are seeing in many of our distinct environments, clearly further action is required where species are still showing decline.

Fishing undoubtedly affects biodiversity. The North Sea has been intensively trawled for decades, and the range of sea bed creatures has been altered. Scavenging crustaceans and starfish have displaced bivalve molluscs and other long-lived species. Out of 21 commercially exploited fish stocks in 2003, 16 are currently considered to be fished beyond safe biological limits. This in turn has led to the exploitation of deep water, slow growing, long lived and therefore more vulnerable species – such as orange roughy, and to damage by trawlers of deep water *Lophelia* coral reefs.

Farmland and woodland

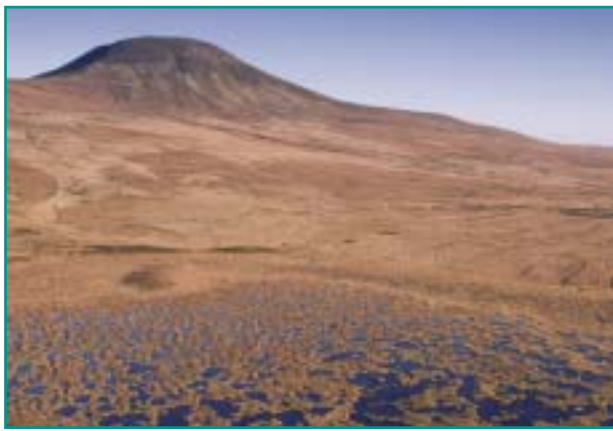
On the land, there have been some notable improvements in recent years, but the news is not all good. Throughout most of the last century increasing intensification in agriculture, and the spread of urbanisation, have led to the loss of much of our semi-natural land, as well as many of our hedgerows and farm ponds. As a result, farmland birds, wildflowers, mammals and pond-life have all declined.

After a period of decline in forest cover, followed by intensive planting with non-native conifers, we are now seeing an increase in the area of woodland with native species. Over the past 20 years there has been a significant shift to more sustainable forest management, including diversification of planted forests, and restoration of management in degraded native woods.

The overall trends in woodland birds are mixed. Some have increased their range and numbers, others have decreased. One of the most notable species in decline is the capercaillie, now down to a mere 1,000 or so birds.

Mountains, heaths and bogs

Moorland, peatland and rough grassland cover 50% of Scotland's land area, and in many ways define the character of Scotland's landscape. But these habitats have changed significantly since the 1940s, and while the rate of change has slowed in recent years, some of the trends continue.



Badanloch Bogs, Ben Griams, Sutherland

The area of heather moorland has declined as a result of afforestation and conversion to grassland. There has been a reduction in regeneration in some areas as a result of large increases in grazing pressure by both sheep and deer. Montane heath has declined, probably as a result of a combination of grazing pressure, nitrogen enrichment and possibly climate change. Afforestation, agricultural practices, and peat extraction have all contributed to declines in blanket bog and lowland bog. Many of our grasslands have lost species richness due to reseeding, fertilisation and more intensive management. Illegal persecution of raptors continues to be a problem in many areas.

There is some good news though. The total area affected by potentially harmful levels of nitrogen deposition is expected to decline significantly in the years to come, and changing incentives under the EU common agricultural policy should eventually lead to more appropriate grazing regimes for sheep. And, as noted above, forestry policy and the incentives associated with it, have changed in favour of biodiversity conservation in recent years.

Guarding against invaders

Human activity – either accidental or deliberate – can introduce non-native invaders which damage our native biodiversity.

Escaped North American mink are one of the reasons why the native water vole is now so rare, as they are serious predators of voles, while a fish called the ruffe, introduced in Loch Lomond by anglers, is decimating some of the very special native fish that live there as they out-compete them for food and have higher survival rates. Sika deer now occupy one third of the red deer range – and interbreed with them, harming the genetic integrity of our native species. The introduction of hedgehogs to the Western Isles has wreaked havoc among internationally-important breeding wader populations as hedgehogs eat their eggs. The giant hogweed is now quite common on disturbed ground, where it smothers native plants, as well as causing injury to children every year. With huge increases in large scale marine traffic, alien marine organisms have been spread to new areas when ballast waters are discharged.

The impact of non-native invaders can be rapid and uncontrollable, so we need to guard against the threats, and manage them carefully when they arise.



Giant Hogweed

2.4 What are the implications of climate change?

Air and sea temperatures are predicted to increase significantly in the 21st century – by as much as 2 to 3°C. East coast waters will warm at a greater rate than those in the west. We can anticipate wetter autumns and winters, drier, hotter summers and more unpredictable weather events. Changes in precipitation will affect run-off and erosion. These changes will affect biodiversity.

Already there are signs of change. The nuthatch and kingfisher appear to be moving north. In the future, birch may increase in pinewoods, oak may increase around the margins, and the tree-line will probably shift upward from its current level of 650m. Arctic-alpine habitats may disappear completely from our mountain tops, along with birds like the dotterel and snow bunting.

In the marine environment, there is likely to be an increase in the number of southern species entering our waters; but we may lose species such as the sea-pen, the green sea urchin, and possibly the cod. Sea level rises – predicted at up to 70cm by 2080 – will affect coastal habitat, and this rate of change may be greater than the rate at which some species can adapt.

But perhaps the most important issue will be the extent to which species can shift their range as climate change takes place and sea levels rise. If they can adapt, the impacts on biodiversity will be limited and possibly positive. But for many less mobile species – especially on land where their habitat is already fragmented this shift will not be easy. So in addition to working towards targets to reduce greenhouse gases, we need to plan for these shifts, by maximising the connections between habitats and minimising the barriers to movement and dispersal.

Managing coastal realignment

Every year 100 hectares of saltmarsh and mudflats are lost in the UK as a result of rising sea levels and erosion. These are key habitats for biodiversity – many being internationally recognised for their importance for wildlife.

Whilst it may be some years before international action to cut the emission of greenhouse gases yields real results, there is already much being done to adapt to the predicted effects of climate change on our coasts. In February 2003, the seawall at Nigg Bay was breached allowing a 25 hectare field to flood and revert to intertidal habitat using a process known as 'coastal realignment'. This is the first time that this approach to dealing with rising sea levels, flood risk and coastal habitat loss has been tried in Scotland.



Nigg Bay Realignment Site, Nigg Bay, Cromarty Firth

Bogs and so much more

The quality of Scotland's bogs and marshes is recognised worldwide, though most people don't always recognise them as assets. But they are! Bogs have been storing carbon in the form of peat for thousands of years – if they are drained and allowed to dry out this carbon is released into the atmosphere, adding to the greenhouse gases, which are causing climate change.

Bogs and marshes also reduce the risks of flooding, serving as a buffer against rapid

run off during exceptional downpours. They help maintain a consistent supply of clean water to rivers and lochs including Scotland's famous game fishing sites. And if this were not enough, bogs and marshes are also home to special plants, birds and insects not found elsewhere. The carnivorous sundew, the bog asphodel, the dunlin, snipe and golden plover; the great variety of small, often unnoticed but nonetheless beautiful sphagnum bog mosses and liverworts.



Sphagnum moss bog pool, Creag Meagaidh National Nature Reserve (NNR)



3

Issues and
opportunities

3. Issues and opportunities

The basis for a biodiversity strategy

In this section we consider what it is we are trying to achieve, the kind of issues that we need to address and the kinds of action that need to be taken if we are to succeed. This serves as a rationale for the strategy objectives set out in section 4.

3.1 Why does the loss continue?

As we have seen in the previous section, some of our biodiversity has been lost, and this loss is continuing, albeit at a lower rate. The causes and threats are many and are explored in detail in the supporting documents for this strategy.

Many of the threats are now being much better managed, but we still have some way to go. A key issue is the intensity of resource use. Intensive and unsustainable resource use lies at the heart of much biodiversity loss in both terrestrial and marine environments, but these have also been important factors in our economic development. Sustainable development, and sustainable resource use, recognises the need to balance social, economic and environmental interests to ensure that the drive for economic growth does not compromise the welfare and quality of life of current and future generations. The continuing loss of biodiversity suggests that we have not yet achieved this balance.

This is partly because we lack the decision-making procedures to achieve this balance. It is partly because we do not value biodiversity as much as we value some forms of economic development. It is partly because we simply do not understand, or communicate effectively, many of the values of biodiversity, or the complex links between them. And it is partly because we often do not recognise the opportunities to enhance biodiversity, and in so doing to improve the quality of our lives and increase economic opportunities.



Black Grouse

3.2 What are we trying to achieve?

Our overall aim is to conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland now and in the future. But what does this mean in practice?

Conserve what we have

We should seek to conserve what we have. We should do whatever we can to halt the decline and where possible reverse losses in biodiversity. We need to protect the best and enhance the rest. In so doing, we will generate wider environmental, social and economic benefits.

Sustain healthy ecosystems

But we also need to address wider environmental issues. Most wildlife is dependent upon a complex environment. Conserving biodiversity is often unsuccessful if we concentrate on limited patches. We need to look at the bigger picture: reconnect nature; extend and link up habitats; reduce barriers; and understand the dependencies and needs of different species. We need to think in terms of landscapes and ecosystems, not just in terms of species and habitats.



Woodland sites provide important wildlife corridors

Usually, though not always, this means creating a mosaic of linked and varied habitats to form larger, more stable habitat units, richer in biodiversity – not just in the countryside, but also in urban areas, and with links between the two. And we need to ensure that our actions at this level sustain and support those species and habitats which we value, and which are important for the maintenance of healthy and productive ecosystems – from the osprey, bumble bee and Scottish primrose to the complex web of organisms which contribute to productive soils and fisheries, to clean air and pure water.

Biodiversity is all about networks and connections: the web of life; ecosystems. A piecemeal approach to biodiversity conservation and enhancement won't work.



Dor beetle, Birks of Aberfeldy, Perthshire

Engage more people

The underlying reason for biodiversity conservation is to ensure that our generation and future generations reap the benefits of rich biodiversity and healthy ecosystems in terms of productive natural resources, economic opportunity, spiritual inspiration, and cultural enrichment. Engaging more people in biodiversity conservation represents both an end in itself and a means to an end. It will enrich our lives and those of future generations. *Everyone should benefit.*

Promote sustainable development

Scotland is committed to sustainable development. This means that we must take account of social, economic and environmental issues in all our development decisions, and ensure that we do not squander resources which may benefit future generations – including biodiversity.

Although we now have measures in place designed to promote sustainable development, many of our decision making mechanisms fail to give sufficient weight to its various dimensions. This is not surprising – social and environmental benefits are typically much harder to define than financial benefits. We must redress the balance and develop new approaches which take account of a wide range of current and possible future values.

3.3 How can we achieve it?

3.3.1 Bring biodiversity into the mainstream

Biodiversity conservation is often seen as a specialist issue; something for the environmentalists. It needs to be brought into mainstream decision making. Not enough of us consider it to be our own responsibility – or opportunity – and this dramatically reduces the potential for biodiversity conservation and enhancement.



Cattle grazing above Aoradh, Loch Gruinart RSPB Reserve, Islay

Very little of our land or water is currently managed to benefit biodiversity. While 20% of Scotland is covered by one type of environmental designation or another², most of these sites are still managed primarily for commercial purposes, albeit with certain constraints designed to prevent serious loss of biodiversity. As a result, large parts of these designated areas, and much of the wider environment is subject to little if any management specifically directed towards conserving biodiversity. In many cases this is not an issue: much land and water use is perfectly compatible with, and in some cases enhances biodiversity. But elsewhere there is direct conflict between biodiversity interests and commercial interests.

In rural areas, the agri-environment schemes are a step in the right direction, but environment-friendly land and water management, fisheries management, and business activity should be the norm not the exception. Conditions relating to the safeguarding and enhancement of biodiversity should be routine for any form of public subsidy or grant. The cross compliance arrangements introduced as part of the Common Agricultural Policy Reform package are an important step in this direction.

However, this is not just an issue for rural businesses. All businesses affect biodiversity either directly through their management practices, or indirectly through their use of resources as raw materials or their generation of waste. While energy efficiency and waste management have risen up the business agenda, biodiversity is still a marginal consideration. So there are opportunities to make biodiversity a mainstream business issue – and local and national government, public and non-government agencies all have a role to play in promoting this, especially amongst smaller companies.

3.3.2 Targeted action for species and habitats

Some species are at risk, and urgent action is required for their conservation. The UK Biodiversity Action Plan and the Local Biodiversity Action Plan network provide a framework for prioritised and targeted action for species and habitats. This process is strengthened by, and strengthens, the on-going management of designated sites where our most vulnerable biodiversity occurs and needs the strongest protection.

We should build on the opportunities associated with site designation, and ensure that management for biodiversity conservation extends outside the boundaries of designated sites, through initiatives such as Important Plant Areas and Local Sites. We should work to ensure that designation enhances value and increases responsibility. We need to identify ways in which biodiversity can bring short term as well as long term benefits. We need to get wider support for the appropriate management of designated sites; and to promote support for actions under Local Biodiversity Action Plans. We need to get those responsible in national and local government, including community councils, to examine their plans and actions, and see how they can help.

If sites are special, then people should be proud to keep them special. We should ensure that designation enhances value and increases responsibility.

² Sites of Special Scientific Interest; National Nature Reserves; National Scenic Areas; Wetlands of International Importance; Special Areas of Conservation; Special Protection Areas; Local Nature Reserves; National Parks

Local Sites

Local Sites are of great value to people living in Scotland's towns, cities and countryside, providing opportunities for lifelong learning, access, health and the economy, as well as helping to achieve biodiversity objectives.

There are over 3,000 Local Sites in Scotland designated by local authorities. These non-statutory sites (sometimes called Wildlife Sites or Sites of Interest to Nature Conservation) complement Sites of Special Scientific Interest (SSSIs) and help to underpin national and international government conservation objectives. Local Site systems aim to identify all land of high nature conservation value in a local authority area and foster action at a regional and local level.

These sites have a crucial role in realising Biodiversity Action Plan (BAP) targets, and are increasingly being incorporated into Local Biodiversity Action Plans (LBAPs) across Scotland, as the survey process helps to identify and target priority habitats and species which need active management. Improvements to the sites can be secured through partnerships between local authorities, land owners, Non-governmental organisations (NGOs) and government agencies, working together to deliver site management plans. Local Sites are recognised in local land use planning policies giving them an enhanced level of protection when local authorities consider proposals for new developments.



Roslin Glen, Midlothian

We should also be wary of invasive non-native species which can threaten native species and habitats. The need to improve legislation to manage the movement and use of non native species is currently being assessed, but it is undeniable that greater awareness and knowledge of non-native species is necessary.

3.3.3 Better managed landscapes and ecosystems

Managing landscapes and ecosystems may sound daunting, but we already do it. Current patterns of land-use are largely defined by the EU Common Agricultural Policy, the Scottish Forestry Strategy, the Rural Development Plan and the raft of incentives and constraints associated with them. The pattern of exploitation and the current state of our fishery resources is greatly influenced by the EU Common Fisheries Policy.

Most of these policies now emphasise sustainable development and the need to balance incentives for production with those for environmental conservation and enhancement. The common fisheries policy specifically recognises the need for an 'ecosystem' approach to fisheries management. We have to ensure that these important ideas are implemented in practice.



Muirburn, Glen Gairn, Grampian

We need to ensure that the broad set of incentives and constraints associated with European and national policy result in biodiversity conservation throughout rural and marine environments.

National and local government are directly responsible for large areas of land and water – parks, roadside verges, local nature reserves, school grounds and sports fields, national forests, coastal waters. Looking after these resources, and finding ways to enhance biodiversity as a routine part of management is a duty under the anticipated Nature Conservation (Scotland) Act 2004. Actions may include sensitive planting and mowing regimes, minimal use of chemicals, and habitat creation where appropriate. There are opportunities to link new and existing habitat through improved planning, design, co-ordination and management of all open spaces, and at all levels. The benefits can be manifold: lower management costs in some instances, enhanced biodiversity, greater enjoyment and appreciation of nature.

The planning system also has a key role to play. National planning guidance and advice³, sets development planning within the context of good environmental stewardship and sustainable development. However, the potential for conflict between short term commercial interests and long term or less easily measured biodiversity benefits is real. We need better decision making protocols, and in the case of environmental assessment, we need to ensure that any trade-offs between biodiversity and more immediately commercial interests are thoroughly examined and understood, including an appropriate assessment of risk.

We also need to think more carefully about the chain of effects our actions can cause. When we develop best practice, or undertake environmental assessment, we should not just consider direct and immediate impacts; we

should consider possible knock-on effects on other organisms – both positive and negative – and the cumulative effects our actions – together and individually – will have.

Strategic environmental assessment is an important tool which should help address many of these issues. The challenge here will be to ensure that the process is adequately informed and that biodiversity values are fully understood by decision makers and taken into account.



Nigg Bay, Cromarty Firth

3.3.4 Ensuring integration and coordination

One fundamental problem with the existing pattern of biodiversity management is that much of it is piecemeal. This relates partly to widely differing priorities – within the Local Biodiversity Action Plan network; between different non-government organisations; between agencies and government departments; between environmental and commercial interests. It relates to the limited attention to biodiversity in planning, design and best practice – and indeed in all decision making. It relates to a lack of integration between a myriad of policies and interests.

³ Particularly NPPG 14, PAN 60, PAN 65 and SPP1

We are moving in the right direction. There are now many initiatives which attempt to address these problems, and promote increasingly 'joined-up' thinking: the local firths partnerships which serve as forums for the exchange of ideas and perspectives; the catchment management plans under the Water Framework Directive; the Rural Development Plan; the Scottish Forestry Strategy; the Forward Strategy for Scottish Agriculture, and the forthcoming strategy for Scotland's Coast and Inshore Waters (2004) – these and others are all important and essential. We need to build on and strengthen these approaches, particularly in terms of decision making processes; and we need to develop similar approaches for land use in urban and rural areas, and marine resource use. And we must ensure that biodiversity considerations, and in particular Local Biodiversity Action Plans, are integrated into these processes, and indeed into all decision making processes which ultimately affect the environment.

But whatever mechanisms or institutions we develop to promote integration, the extent to which these are effective will depend upon the awareness and capacity of all those involved – whether they be the officers of national agencies or local government, farmers, fishermen or businessmen.

3.3.5 Encouraging awareness and engagement

We need to ensure that individuals, public servants and private enterprise are aware of the potential for biodiversity conservation in relation to their own actions, and capable of making a positive contribution. Better planning and more appropriate incentives from government must be matched by a capacity to initiate and respond at a practical level.

Almost everyone already has, or could have, a positive or negative impact on biodiversity – via their political choices, their jobs and economic activities and their daily actions. There is a huge opportunity for all us to become more aware and more responsible; to enhance biodiversity generally through the cumulative effects of thousands of positive actions, small and large; and in so doing to enhance the quality of our lives and the opportunities for the future.

Perhaps the greatest challenge is to make everyone realise that they have an impact on biodiversity and can play a part in its conservation. We need to put people at the heart of our strategy.



Observation platform, Wood of Cree RSPB Reserve

Many people are already engaged with voluntary conservation and environmental organisations. This is a huge resource which can be built on to enhance biodiversity all around us. But we need to promote even greater awareness of the full range of values of biodiversity to help people understand and enjoy the natural environment. This will lead to even more voluntary action, better debates, more informed choices and decisions, and higher levels of compliance with relevant regulations. It will underpin the sustainable use of key species and natural resources more generally. It will serve as a stimulus to business to be more innovative in attitudes and actions relating to biodiversity and to develop best practice initiatives.

Greater engagement of people with biodiversity will also lead to more healthy, productive and enjoyable outdoor experiences, reduced stress, and an increased sense of responsibility across the board. In particular, childhood experiences are a powerful influence on how people react to the environment in adulthood, so providing opportunities for children, especially those from deprived areas and backgrounds, to interact freely with biodiversity in a safe environment is vital.

Do a little – change a lot

Our individual actions may seem insignificant and unimportant when set against the great environmental issues of our time, and many people feel unable to help. This is wrong. The issues we face today are precisely the result of millions of small actions. What we buy, what we eat, our use of fuel, the way we deal with waste, how we manage our gardens, how we engage with decision makers – all of these actions ultimately have an effect on biodiversity and the physical environment. We should not shrug off our personal responsibility, simply because progress will depend upon many of us acting responsibly together. Rather the reverse.



Flotsam and jetsam, sea-borne litter on the tideline, Islay

3.3.6 Improving our biodiversity knowledge

Increased awareness and opportunities to engage with biodiversity will generate few benefits if understanding is limited and good accessible advice lacking.

There is a long established tradition in the UK of observing and recording the natural world. It is estimated that some 2,000 statutory and voluntary organisations and societies and over 60,000 individuals currently hold biodiversity information for the UK. We need to use this information more effectively, and the National Biodiversity Network is a welcome development in this regard. There has also been a major effort to rationalise and co-ordinate information gathering under the UK Biodiversity Action Plan and the Scottish Biodiversity Research Forum, and these efforts will continue.

However, by definition biodiversity is complex, and there will always be significant gaps in our knowledge. The challenge is to identify the most critical gaps in our knowledge, and

to then undertake appropriate research and survey in the most efficient and effective manner. To this end, the Scottish Biodiversity Forum has developed a research strategy, and this will need to be updated as part of the strategy review process. There is also an opportunity to foster increased participation of resource users and social scientists in developing research objectives, programmes and projects, and to engage users as much as possible in the research and survey itself.

We have an opportunity to supplement the essential baseline with much more information, and in the process engage a far wider range of people. Initiatives such as Garden Watch, and internet-based reporting offer a challenging new area for education, engagement and monitoring. We can draw on the knowledge, skills and resources of fishermen and fish farmers, land managers and outdoor workers in general. We can exploit the interest and enthusiasm of special interest groups – divers, sailors, walkers. We can facilitate learning and recording by school children and students.

But raw data is not enough. We need to improve access to appropriate and stimulating advice on how to enhance biodiversity. Much information is already available through the UK Biodiversity Action Plan web site, but we need to go further and develop a single gateway to practical advice and best practice. This would also help to reveal the gaps in our existing practical knowledge and contribute to the prioritisation, promotion and rationalisation of research.



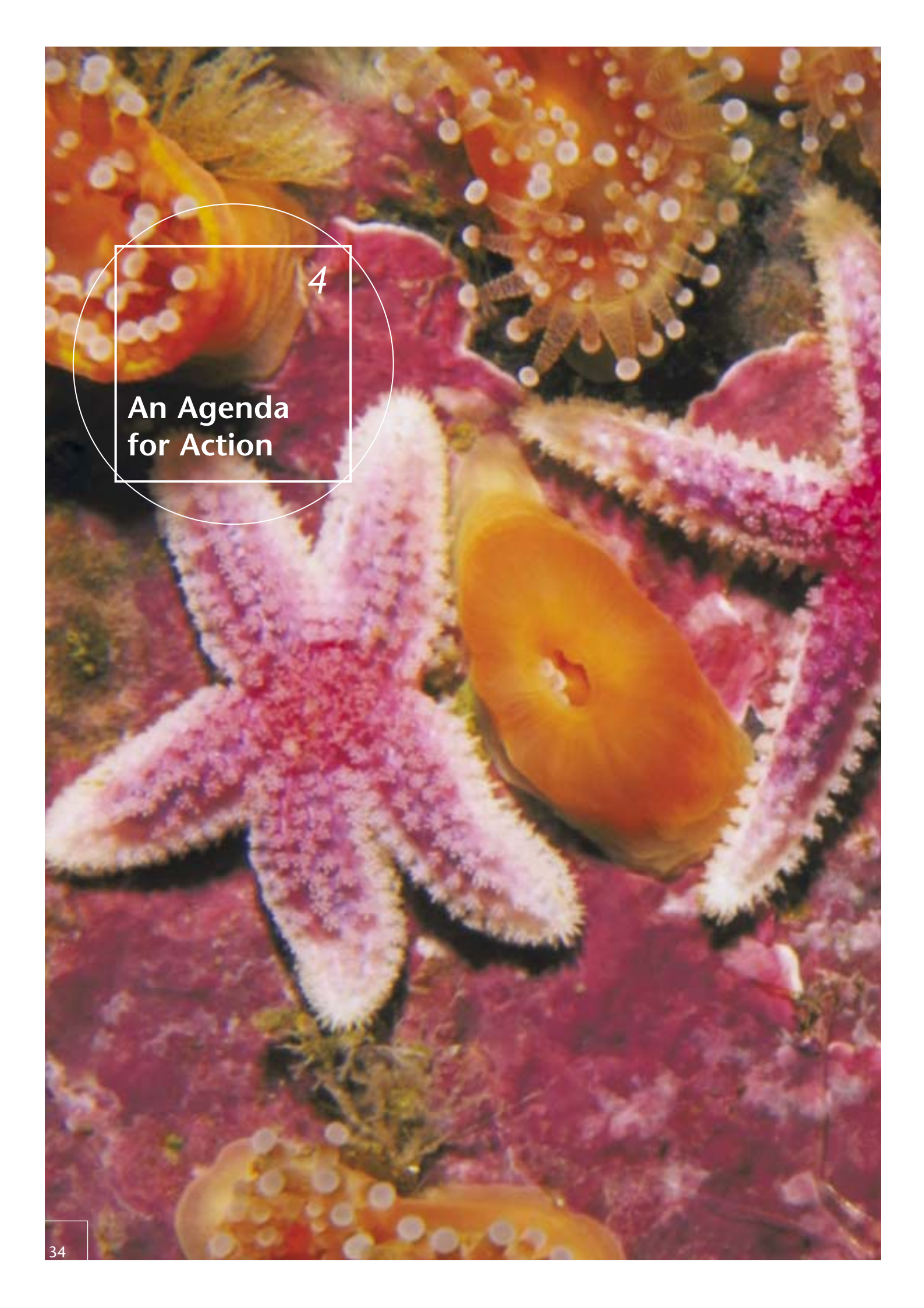
Green Shield Moss Moniak Gorge, Inverness

We also need to continue to produce targeted guidance materials for all those whose activities have a significant impact on biodiversity and we need to ensure that guidance is truly relevant and practical. Partnership initiatives to produce such materials represent a major opportunity for sharing knowledge; reducing conflict; and generating consistent advice and incentives.

We also need to ensure that specialist advisors are readily available to inform major decisions. At local level, the Local Biodiversity Action planning officers have a key role to play, alongside sustainable development officers and ecologists, where they are employed, all supported by Scottish Natural Heritage, the Scottish Environment Protection Agency and other national organisations. Local government and government departments will need to examine their procedures for accessing appropriate advice in relation to the strategy objectives.



Lichen on hazel tree, Barnluasgan Wood



4

**An Agenda
for Action**

4. An Agenda for Action

In this section we arrive at our agenda for biodiversity conservation. We explore where we hope to be in 25 years time – the desired outcomes in relation to each of five stated objectives. We then present an agenda for action for each objective.

Setting out our aim and objectives

The overall aim of this strategy is:

to conserve biodiversity for the health, enjoyment and wellbeing of the people of Scotland now and in the future

The foregoing analysis suggests the need for balanced action across a range of areas to meet this broad aim. The required actions can be grouped under five major strategic objectives:

Species & Habitats: To halt the loss of biodiversity and continue to reverse previous losses through targeted action for species and habitats

People: To increase awareness, understanding and enjoyment of biodiversity, and engage many more people in conservation and enhancement

Landscapes & Ecosystems: To restore and enhance biodiversity in all our urban, rural and marine environments through better planning, design and practice

Integration & Co-ordination: To develop an effective management framework that ensures biodiversity is taken into account in all decision making

Knowledge: To ensure that the best new and existing knowledge on biodiversity is available to all policy makers and practitioners

On the following pages, we take each of these objectives in turn, and explore where we hope to be in 25 years time – the desired *outcome* – in relation to that objective. This leads us to an *agenda for action* for each objective. Since this is a 25 year strategy it cannot be detailed and prescriptive, nor can it designate responsibility for implementation. It summarises the main kinds of action that will need be taken forward through the implementation plans over the coming years.

This *agenda for action* has been developed on the basis of wide consultation and review of supporting documents, and has drawn in particular on the higher level actions and objectives identified by working groups engaged in the development of the implementation plans, and on the agenda for action identified in “Biodiversity Matters!”.

It is important not to consider each objective and *agenda for action* in isolation. They are closely linked and mutually supporting. In particular, many of the strategic actions under the people, integration and knowledge objectives support the species and habitats and landscapes and ecosystems objectives, and actions under landscapes and ecosystems support those under the species and habitats objective and vice-versa.

Opencast mine to nature park

Greenhead Moss in North Lanarkshire lies on the site of former opencast coal and landfill operations. In 1997, North Lanarkshire Council resisted further applications for opencast and related developments, compulsorily purchased the site, and began the task of reinstating the landscape. A restoration plan was established to reverse the decline in a remnant of raised bog on the site; encourage more local use of the site; increase biodiversity; and provide training for local unemployed people.

Local people have always had close ties with the site, and had campaigned against proposed extensions to mining and landfill operations in the mid-1990s. A Community Trust was established, with nominations for community directors being received from all the distinct communities around the site. Today, the Greenhead Moss nature park is run by the Trust – a partnership of the public sector and local people.

4.1 Species & Habitats

Protecting and restoring our assets for future generations

We now have in place in Scotland a network of designated sites, as well as the UK Biodiversity Action Plan and the Local Biodiversity Action Plan network. Great progress has been made and there are signs that some of the species and habitats declines are now slowing or being reversed. But if we are to come close to our commitments under the Convention on Biological Diversity, or to European or UK targets, we need to strengthen this process.



Objective

To halt the loss of biodiversity and continue to reverse previous losses through targeted action for species and habitats.

Outcome 2030

The loss of priority species and habitats has been halted, and many priority species and habitats are increasing in both numbers and range. The overall balance is positive. Comprehensive monitoring systems are in place to enable accurate assessment of the state of our biodiversity. Where decline continues, the reasons are understood, and measures are in place to minimise losses. The genetic diversity within species is better understood and actions to conserve this diversity for priority species are in place. The spread of invasive non-native species has been slowed or halted, and specific areas, regions or islands are designated as free from some invasive and non-native species. Rare and specifically 'Scottish' varieties of domestic plants and animals have been catalogued and more effectively conserved.

Wider countryside measures ensure that further species are not joining the priority list, although there is recognition that some changes due to climate change are inevitable and irreversible.



Sphagnum moss and stems of cotton grass, Braehead Moss



A cowrie on a serpulid worm in Loch Creran

Agenda for action

1. Deliver the actions and outcomes identified in the UK species and habitat action plans relevant to Scotland
2. Strengthen and further develop monitoring of habitats and species to ensure that progress against UK Biodiversity Action Plan (UKBAP) targets and other indicators can be measured
3. Encourage the Local Biodiversity Action Plan network and ensure it has adequate resources to support the delivery of national objectives and to facilitate action by local people
4. Improve the co-ordination and management of the Local Biodiversity Action Plan network – between Local Biodiversity Action Plans and with national level Biodiversity Action Plans
5. Develop at local level further actions for biodiversity conservation and enhancement that take full account of climatic, economic and land-use change
6. Manage the Natura 2000, Ramsar, SSSI, and National Nature Reserve site network to protect and where appropriate enhance conservation interests
7. Manage National Parks to protect and where appropriate enhance conservation interests
8. Manage existing and develop new local nature reserves and wildlife sites to protect and where appropriate enhance conservation interests
9. Facilitate action by local people to identify and protect important species and habitats
10. Implement our commitments to marine protected areas under international commitments
11. Minimise the detrimental impacts of non-native invasive species

The corncrake and crofting practice

The corncrake is threatened throughout Western Europe. In Britain, it declined rapidly throughout the 20th century as a result of changing agricultural practices, and is now confined mainly to the island crofting areas of Scotland's west coast where it breeds in the summer. It spends the winter in East Africa, south of the Sahara.

The Corncrake Species Action Plan is being implemented with funding from The Royal Society for the Protection of Birds and Scottish Natural Heritage assisted by the Scottish Crofting Foundation, to support crofters and farmers in providing secure habitat for breeding corncrakes throughout the season. This involves early cover, late cutting and corncrake "friendly mowing" of meadows to protect nests and late cover for chicks. The species has now made an encouraging recovery to late 1970s numbers and the corncrake's rasping call is once again becoming more common on Hebridean islands such as Coll and Tiree where many tourists come to hear and see these charismatic birds.



Corncrake calling in hay meadow at dusk, Tiree

4.2 People

Putting people at the heart of our biodiversity strategy

Despite widespread concern for wildlife, relatively few people, organisations or businesses actually engage in biodiversity conservation, or enjoy the benefits it brings in economic, health and quality of life terms. There is a tremendous opportunity here to make biodiversity a core value in Scottish culture, and to ensure that everyone in Scotland recognises and enjoys the complexity and beauty of the environment, and takes steps through actions in their work and daily lives to conserve and enhance it.



Thrift growing on the harbour wall at Kinloch, Isle of Rum NNR



Sowing wild bird cover



Objective

To increase awareness, understanding and enjoyment of biodiversity, and engage many more people in conservation and enhancement.

Outcome 2030

A sense of responsibility for and stewardship of biodiversity is a core value in Scottish culture, and particularly for all users and managers of land and water. Corporate responsibility reporting is widespread among businesses and includes reporting on environmental and biodiversity issues and appropriate best practice.

More people understand and enjoy the social, economic and environmental benefits of biodiversity. All those who work directly with nature and natural resources – farmers, foresters, gamekeepers, fishermen, fish farmers, gardeners, civil engineers, architects, land, park and open space managers and designers – have increased awareness and understanding of biodiversity issues, are better able to identify and motivated to develop opportunities for biodiversity enhancement, and have become more engaged in advising on the best ways forward.

Children and adults experience more firsthand learning about biodiversity in the open spaces around them, and reinforce the demand for action at all levels to enrich biodiversity in parks and golf courses, sports fields, transport corridors, green and brown-field sites. Many more people recognise and enjoy the complexity and beauty of their environment and take steps, through actions small and great in their daily lives, to conserve and enhance it.

Agenda for action

1. Strengthen the role of the Local Biodiversity Action Plan network in engaging a wider range of people in biodiversity conservation, and in exploring innovative ways of promoting interest in biodiversity
2. Ensure that people, enterprises, and government at all levels understand the values of biodiversity, and how their actions affect biodiversity
3. Review and where necessary enhance the place of biodiversity in formal education
4. Encourage and facilitate first hand learning about biodiversity in the natural environment
5. Encourage ownership, responsibility and best practice in relation to biodiversity on the part of individual, enterprises and government
6. Facilitate incorporation of biodiversity in corporate responsibility initiatives, codes of conduct and other market-led mechanisms
7. Promote sustainable tourism and sustainable use of biodiversity resources
8. Facilitate enjoyment and appreciation of biodiversity, and its links to healthy living
9. Coordinate and support the provision of access to, and understanding of, natural habitats in deprived communities
10. Encourage active community involvement in biodiversity conservation and enhancement through volunteering and enjoyment of wildlife and green space
11. Encourage biodiversity conservation as a key element in community planning
12. Facilitate identification and recognition of local wildlife sites and local nature reserves and their use to stimulate local awareness, engagement in conservation and education



Inverpoll NNR Interpretation Sign, Inverpoll

People make the links

The tree planting and woodland development at Garmouth in Moray provides a living green space linking the village with the Spey Viaduct Walk, as well as a craft centre. The community has been involved since the outset in the planning, and later in tree planting and path creation – freely contributing their labour, energies, ideas, and enthusiasms. Within the wood a pond has been created, providing a rich focus for wildlife, with plenty to keep the interest of walkers. By working together, the owners and community have added value from the creation of a community woodland to give future generations in the village great pleasure.

People do care

Affection and care for the natural environment and biodiversity is widespread, shown by the level of support for organisations, the popularity of television wildlife programmes and the increasing numbers taking part in biodiversity related activities. The RSPB's "Big Garden Birdwatch", encourages people to record birds for an hour in their garden, school or a local park and send their observations in for analysis. From modest beginnings in the 1970s, the Big Garden Birdwatch has gone from strength to strength, and by 2004 over 22,000 people across Scotland were getting involved.

4.3 Landscapes & Ecosystems

Shaping the bigger biodiversity picture

We need an enhanced appreciation of the relationship between different elements in landscapes and ecosystems, and the degree to which they are mutually dependent and supporting. We need to recognise and take account of the value of ecosystems and the services they provide. We need to 'reconnect' fragmented habitats and populations, and ensure that as climate change takes effect, wildlife can move and adapt as far as possible. This will require better planning, forward thinking and more coordinated action by different departments, agencies and business.



Upland landscape in the Glenshee Hills



Common Starfish and sea anemones, St Kilda



Objective

To restore and enhance biodiversity in all our urban, rural and marine environments through better planning, design and practice.

Outcome 2030

Scotland's landscapes are attractive and diverse; and terrestrial and marine ecosystems are healthy, productive, and rich in biodiversity. Planning is more strategic and more integrated, taking full account of the complex relationships between different elements and activities in landscapes, seascapes and ecosystems, in both time and space.

The overall pattern of land and water use, in both rural and urban environments, supports a rich and varied array of wildlife. Organisms can move, feed, reproduce and disperse effectively, and are better able to adapt to changing circumstances of land use and climate change. Farmland, urban green-space, transport corridors, gardens – and indeed all 'managed' environments including coastal and marine – have become richer in wildlife through widespread improvements in design and practice.

Agenda for action

1. Adjust and apply measures under the Common Agricultural Policy and the Common Fisheries Policy to reinforce landscape and ecosystem level planning and support appropriate conservation management
2. Provide incentives to create and link habitats and conserve/create important underpinning landscape features in all open spaces
3. Co-ordinate policies and actions relating to forestry, farming, transport and infrastructure, and urban spatial planning to maximise habitat linkage and minimise further fragmentation
4. Enhance biodiversity in all transport corridors, and public and private greenspace through public and private sector initiatives
5. Develop guidance in relation to maximising biodiversity in all open spaces, and in relation to landscape and ecosystem level planning and management by responsible authorities
6. Improve the management of marine resources, seascapes and ecosystems to take full account of the interactions between species – commercial and non-commercial
7. Further reduce chemical pollution from all activities on land and sea
8. Minimise the risk of farmed organisms adversely affecting wild organisms, directly or indirectly, through conditions and protocols, and through spatial zoning where appropriate
9. Develop cost effective indicators relating to landscape scale biodiversity and habitat linkage, ecosystem health, genetic diversity and structural diversity



Water lillies and reeds, lochan, Achmelvich, Sutherland

4.4 Integration and Co-ordination

Improving the management framework

We need to improve the management of biodiversity in all its dimensions. At the present time the scope of management for biodiversity is limited; incentives to conserve and enhance biodiversity are relatively few and sometimes uncoordinated or contradictory; decision making processes at all levels often fail to take account of biodiversity. Biodiversity management is seen as something for specialists, rather than something which everyone should address as a routine part of their decision making.



Objective

To develop an effective management framework that ensures biodiversity is taken into account in all decision making.

Outcome 2030

Biodiversity – and Local Biodiversity Action Plans – are taken into account in all significant development programmes and grant schemes; and in policy, planning, design and development decisions taken by government and business. Local Biodiversity Action Plans are better co-ordinated with each other and with national biodiversity objectives, and they are more effectively communicated to relevant decision makers and practitioners.

Incentives are in place at all levels to encourage biodiversity conservation and enhancement and to include biodiversity as a routine component in best practice. Environmental assessment procedures specifically address biodiversity issues, including cumulative impact. This strategy and its associated implementation plans have become a major force for the successful integration, facilitation, co-ordination and promotion of biodiversity action.

Analysis of monitoring data reveals trends and issues requiring action across different arms of government. Mechanisms are in place to initiate and co-ordinate such action.



View of field pattern, Oronsay



Orkney Mainland, Aerial View

Agenda for action

1. All public bodies should take account of, and further biodiversity conservation and enhancement in all their functions and activities
2. Increase integration between policies, programmes, actions and incentives across government to deliver coherent policy and incentives which enhance biodiversity
3. Improve decision making procedures in government and business planning to address multiple sustainable development objectives (e.g. through strategic environmental assessment); to assess and communicate the implications of alternative actions/objectives; and to ensure that biodiversity values and opportunities are taken fully and efficiently into account
4. Establish the organisations and partnerships needed to co-ordinate and drive the complex processes needed to achieve all the strategy objectives
5. Strengthen existing incentives and develop new ones to extend the range and scope of environment friendly agriculture and land management, forestry, fishing and tourism
6. Further develop cross-compliance – making biodiversity protection and enhancement a condition for grant or subsidy – and explore its use to effect best practice in other publicly funded activities
7. Include standards relating to biodiversity in the development of river catchment plans under the Water Framework Directive (Water Environment and Water Services (Scotland) Act 2003) and in other environmental management plans
8. Establish clear priorities and milestones in the implementation plans to guide progress and achievement
9. Develop reporting protocols and guidelines which include reference to biodiversity for government departments, agencies, local government, and business
10. Develop existing biological indicators as part of a comprehensive and cost-effective suite of indicators for social engagement; effective biodiversity management; landscape scale biodiversity; ecosystem health; and genetic diversity
11. Use the strategy itself as a management tool to ensure effective delivery of biodiversity gains

Working together brings results

Corn bunting and tree sparrow, along with other finches, larks and buntings, have been the subject of management agreements in Aberdeenshire, Fife and Dumfries and Galloway. This has led to areas of wild bird cover being established on set-aside ground to the benefit of these species.



Corn bunting eating grain

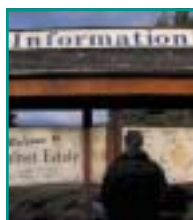
Managing the complex and controversial

The interactions between farmed and wild salmon are complex. The potential, but still poorly understood effects include disease, genetic mixing and competition. We need to establish decision making mechanisms which are better able to deal with controversial and uncertain issues – mechanisms which assess the costs, benefits and risks of alternative approaches to the management of the fishery and fish farming; and which deliver a sustainable future for both industries.

4.5 Knowledge

Gathering, sharing and using the best biodiversity research

Our understanding of biodiversity remains very limited. Despite recent advances, we still have very little idea of what is out there and what is happening to it. Equally, where more is known, much of the existing information and advice is not available in the right form in the right place to help the right people make informed decisions. We need better quality information, more effectively channelled.



Objective

To ensure that the best new and existing knowledge on biodiversity is available to all policy makers and practitioners.

Outcome 2030

Anyone who wishes to learn more about Scotland's biodiversity in general, or in relation to specific issues or opportunities, has ready access to stimulating and appropriate information.

School children, students, researchers and the general public are able to draw on a growing and accessible resource of information on the value and state of Scotland's biodiversity, and practical ways to enhance biodiversity at all levels from gardens to landscapes. More specific, high quality information and advice on best practice are available, tailored to the needs of different sectors and levels of decision makers. Simple access gateways and search systems have been developed to bring together the numerous sources of biodiversity information.

Biodiversity advice is consistent, realistic and accessible. We understand better the contribution of biodiversity to health and quality of life, and the social and economic values of biodiversity more generally. Critical gaps in our knowledge are reviewed regularly by a wide range of stakeholders. Cost-effective and co-ordinated research is undertaken as required.

Agenda for action

1. Further develop the UK Biodiversity Action Plan and the National Biodiversity Network gateways and associated resources
2. Develop an effective gateway, linked to the above, for practical sectoral guidance for biodiversity conservation and enhancement in relation to all major human activities and associated environments
3. Increase accessibility, attractiveness, relevance, and utility of existing information, knowledge, and guidance, e.g. through establishing a network of Scottish Local Records Centres
4. Link, co-ordinate, and rationalise where possible existing sources of information
5. Develop and refine the biodiversity research strategy, and strengthen mechanisms to identify and fill critical gaps in knowledge and understanding
6. Strengthen mechanisms to identify and fill critical gaps in skills and capacity
7. Ensure coherence and consistency of different forms and sources of biodiversity advice from both government and non-government organisations
8. Engage a far wider range of people, and resource users in particular, in gathering information about the state and quality of their environment and associated biodiversity
9. Scientists and resource users cooperate to enhance our practical understanding of natural resource and biodiversity management issues
10. Understand better the social and economic value of biodiversity in all its dimensions, and communicate this knowledge more effectively to key decision makers
11. Improve understanding of ecosystem 'health' and 'resilience' and communicate this to key policy developers, planners, and decision makers
12. Monitor and report on the state of our biodiversity through time and analyse the information effectively to better understand the trends, the causes of change, the impact of interventions, and the opportunities for action to conserve and



Fungus growing on tree

Research and innovation do help

Norway lobster, *Nephrops* (more usually known as scampi or 'prawns'), has long been a key catch for the Scottish fisheries. Seafish and Fisheries Research Services (Aberdeen) have developed new net designs for this fishery which exploit behavioural differences between species to reduce the by-catch of whitefish. Trials suggest a major reduction in whitefish and only a very small reduction in *Nephrops* catch. The benefits to other fisheries and the wider ecosystem are clear. However, we still need more research to develop these designs and more incentives to use them.



Diver on Zostera bed, Eynhallow Sound, Orkney



5

Delivery

5. Delivery

In this section we set down the broad mechanisms for delivery of the strategy, the roles and responsibilities of different agents and stakeholders, and the ways in which the implementation of the strategy will be steered and co-ordinated.

5.1 Everybody has a role

This document presents a vision, aim, strategic objectives, and an agenda for action to guide and stimulate biodiversity action in Scotland. Many different organisations have a role to play in meeting the objectives and achieving the vision. But it is not just the responsibility of the Scottish Executive, public bodies and environmental non-government organisations; at the heart of the strategy is a desire to see every individual, business and organisation take responsibility for and take account of biodiversity in all their actions.

A little more awareness, thoughtfulness, care and creativity will deliver the many small changes which together will help conserve and enhance Scotland's biodiversity. Specialist agencies and non-government organisations will play an important role in facilitating this process, as well as ensuring that existing commitments to biodiversity conservation are met, but the fundamental responsibility is our own, as individuals, not someone else's.

Involvement of all Stakeholders



5.2 Individual responsibility

Our individual actions may seem insignificant and unimportant when set against the great environmental issues of our time, and many people feel unable to help. This is wrong. The issues we face today are precisely the result of millions of small actions. What we buy, what we eat, our use of fuel, the way we deal with waste, how we manage our gardens – all of these actions ultimately have an effect on biodiversity and the physical environment. We should not shrug off our personal responsibility, simply because progress will depend upon many of us acting responsibly together. Rather the reverse.

There are many things that we can do. Thinking about what we buy, where it comes from, and how its production and distribution might affect wildlife and biodiversity, directly and indirectly, will lead to more responsible consumer choices. This applies particularly to food whose production involves land or water management, but also to other products derived from natural sources – timber, natural fibres, oils, cosmetics. People often blame big companies or farmers for negative effects on the environment. But it is consumer choice that ultimately determines what is produced, and increasingly how it is produced and packaged.

We can also engage more directly – by joining a local group to take action to manage local amenity space, by joining a voluntary environmental organisation, or by participating in surveys and monitoring programmes.



Puffin sitting on a rock, beak full of fish, Isle of May

5.3 The public sector

Under the anticipated Nature Conservation (Scotland) Act 2004 all public bodies and individual office holders have a statutory duty to further biodiversity in exercising their functions. This applies to the Scottish Executive itself, to all government agencies, and to local government.

Government departments and agencies

All policy makers must consider the implications of any policy or associated instrument on biodiversity in general, and in relation to the objectives of this strategy in particular. This extends beyond the traditional concerns of the Scottish Executive to all departments and agencies and to any policy which might directly or indirectly impact on biodiversity.



Mosses and lichens growing on the woodland floor, loch Lubnaig, Argyll and Bute

This should not be interpreted in a negative way. There are specific opportunities for the Scottish Executive to strengthen incentives linked to practices and patterns of land and marine resource use that benefit biodiversity, as part of on-going developments related to the Common Agricultural and Fisheries policies, Rural Development, the Scottish Forestry Strategy, the Water Framework Directive, and the Integrated Coastal Zone Management recommendation. But significantly, there are also exciting opportunities for the Scottish Executive to promote biodiversity through its dealings with business, education, health, transport, and development in the many ways detailed in the agenda for action

Clearly government bodies and agencies such as Scottish Environment Protection Agency, Scottish Natural Heritage and Forestry Commission Scotland have a major role in biodiversity conservation. But as private enterprise takes on more responsibility, and local government strengthens its co-ordinating role, they will need more technical help, guidance and advice from these specialist bodies.

Government agencies are also key players in environment-related decision making processes, particularly environmental assessment (both Strategic Environmental Assessment, and Environmental Impact Assessments) and planning consents. As addressed in the Agenda for Action, there are opportunities to strengthen decision making in both these areas.

Local government

Local government has an increasingly important role to play in the promotion of sustainable development and biodiversity conservation. Integration is always easier at a more local level, and more comprehensible in relation to real, practical issues. Local authorities should therefore fully support the Local Biodiversity Action Plans, and take account of them in all their decision making, as well as in their role in education, training and business support.

Local authorities can play a key role in delivering the landscape objective. This is challenging and will require much more forward thinking, strategic planning, and engagement with all those who influence the shape and pattern of land and water use. Integrating national policy with local needs will be a core part of this. Co-ordination of spatial planning, transport corridors and green space management with rural development and farm support mechanisms offers exciting possibilities for linking rural habitats to each other and to urban greenspace.



Tide swept Kelp, North Sanday, Orkney

Local authorities can also have a major influence on the quality of biodiversity within urban greenspace. Good design, more imaginative planting and improved management or guidelines will all help. There is an important opportunity to promote biodiversity as a key component in community planning. Local authorities can also make sure they think about safeguarding biodiversity when they decide on local planning proposals.

Education is a core function of local government. The biodiversity content of mainstream education can be strengthened. More outdoor learning should be encouraged, without prejudicing safety and access requirements. Innovative schemes, such as schools involvement in biodiversity reporting and monitoring could be developed.

Local authorities can also support wider campaigns to promote healthy outdoor living, increase biodiversity in gardens and on business premises, and support and facilitate corporate social responsibility initiatives. They can play an active role in assessment and monitoring of the state of biodiversity within their areas, and also promote more effective recording and exchange of information relating to biodiversity.

The Local Biodiversity Action Plan network

Every part of Scotland has some special biodiversity, and bringing together and presenting information about that diversity, raising awareness locally, and developing plans for its conservation and enhancement will all be vital if the objectives of this strategy are to be achieved. These are key tasks for the Local Biodiversity Action Plan (LBAP) officers.

LBAP officers can also serve a crucial link function – between national agencies and local interests; between theoretical perspectives on biodiversity and practical everyday human perspectives, between different departments whose coordinated actions can sometimes yield significant biodiversity benefits; and between public and private sectors.

More specifically, the local biodiversity officers can raise the profile of, and support, the many opportunities for increased engagement in biodiversity by local government identified above.

The scope of this work is broad, and will only be possible if the network of officers is able to draw efficiently on the skills and advice of specialist agencies and organisations – Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, the many specialist non-government organisations and individual experts, as well as the various bodies associated with the Scottish Biodiversity Forum. Equally, it is essential that the roles of the various agents operating at local level are clearly defined – to maximise synergy and minimise overlap between LBAP officers and, for example, environmental planners or local SNH officers.

To deliver effectively is not just a matter of resources. LBAP officers need to be skilled communicators, negotiators and managers, as well as having solid understanding of local biodiversity, if they are to be effective in their roles.

Higher education and research institutions



Increasing the biodiversity content in training and higher education is central to raising awareness and understanding, and putting biodiversity at the heart of our culture. The biodiversity content of agriculture, fisheries and forestry courses can be strengthened in addition to that in more general land, natural resource, and environmental management courses. But we should also look beyond this for opportunities in other courses to raise the capacity of architects, economists, business managers and public service officers to identify opportunities to enhance biodiversity at the same time as enhancing reputation and service/product provision.

Organisations such as the Royal Botanic Garden, Edinburgh are already doing a tremendous educational job through their many activities and initiatives such as Flora Celtica. Researchers at other applied research institutions should continue to come forward with innovative research proposals relating to biodiversity conservation and enhancement.

Local enterprise companies



The local enterprise company network in Scotland can play a key role in facilitating the kinds of action suggested for the private sector – by helping to raise awareness, through the identification of biodiversity related business or market opportunities, through direct support, and by including biodiversity criteria in their assessment of, or conditions for, grant support.

5.4 The private sector

Land and marine-based businesses

Farmers, foresters, fish farmers, fishermen, sporting estates, tourism operators – all of these groups depend for their livelihood on some aspect of biodiversity, and it is in their long term interests to manage and harvest resources in a sustainable way.

There is an increasing resource of best practice guidance and initiatives, and this should be followed wherever possible. Where guidance does not exist there is an opportunity for users to work together to develop it, and to link it to business benefits. Best practice should be seen as a normal business responsibility and marketing opportunity, rather than as a production constraint.



Highland cows being fed outdoors, Kilchiaran, Islay

Where there are significant short term costs associated with best practice and sustainable management, then mechanisms to capture future benefits arising from improved management need to be identified. Resource users and managers need to engage with relevant authorities to examine the nature of the constraints to better practice, and agree on how these constraints will be addressed. The drivers which previously resulted in damaging or unsustainable practices must be identified and corrected.

At a more practical level, those businesses directly involved in land and water management in urban, rural and marine environments have the opportunity to acquaint themselves with the various guidance materials

relating to management for biodiversity. Many of the practices are cost neutral, and in some cases offer cost savings and should be applied wherever possible.

Where costs are likely to increase then discussions can be opened with the client, who may be willing to pay – especially if savings have been identified in relation to other practices. Best practice may include, for example, reduced use of herbicides and pesticides, sensitive mowing regimes, leaving field margins, and more positive measures such as mixed planting, and habitat creation.



Oyster farmer on the strand between Oronsay and Colonsay

The wider business community

Business in all its shapes and forms is a dominant cultural and political force, and as such has a responsibility – just as much as government – to promote sustainable development and improved environmental management in all its dimensions, including biodiversity. Of course, the primary objective of any business is to make money: to ensure that it stays in business for the benefit of shareholders, employees and society at large. But many businesses, both large and small, naturally consider corporate social responsibility as an integral part of their values, so fostering responsible business behaviours is not necessarily about imposing new burdens, but rather about building on this existing commitment.

For the vast majority of businesses, it is the pressure to keep costs down which can sometimes bring them into conflict with their wider social objectives. However, in developed societies such as ours, consumers are increasingly prepared to pay for responsibly produced products and services. But businesses should not wait for consumer demand to dictate best practice. They know their production practices (or those of their suppliers) and they can see where improvements can be made. So the challenge is to identify either cost saving or cost neutral improvements or, where increased costs result, to persuade consumers to pay for better practice.

Many companies already involved in formal Environment Management Systems, such as ISO14001 which seek continuous improvement, are finding that they can do things to help biodiversity once the relatively quick wins on energy and waste have been achieved.

Environmental non-government organisations (NGOs)

Environmental NGOs and voluntary bodies have the energy, commitment and flexibility to promote and facilitate the implementation of the strategy in all its dimensions. NGOs support the implementation of Habitat and Species Action Plans, and in many cases are the lead partner for Species Plans, helping coordinate their delivery and monitoring progress. They also play an important role in collecting valuable information, carrying out research, raising awareness, campaigning for action and providing guidance and advice to government, businesses and individuals.



Yellow flag growing by lochan, Orkney

Membership of environmental organisations is increasing steadily, showing the importance of environmental issues for many people, and their readiness to get involved. NGOs provide clear and accessible ways for individuals to understand and enjoy biodiversity, and to play their part as volunteers in conserving or restoring it. These organisations play an important part in raising awareness and campaigning for action.

A number of NGOs own and manage land for the benefit of biodiversity, and are actively involved in trying out biodiversity conservation approaches and advising government, businesses and individuals on solutions. The work of environmental NGOs complements many dimensions of the strategy – and their involvement and their potential to focus the interest and efforts of individuals should be encouraged.

The media

The national and local media throughout Scotland – newspaper, TV, radio, internet – can all make a huge difference to the success of the strategy, and indeed their co-operation is essential in support of the people and knowledge objectives.

5.5 Guidance, co-ordination and implementation

The **Scottish Biodiversity Forum** will continue its current role as an influential and inclusive grouping of bodies and individuals actively engaged in biodiversity. To ensure the effective implementation of the strategy, and to review progress, a small implementation team will be formed, which may be located either in or outside the Scottish Executive. This team will be overseen by and report to a steering group which will include representatives of central and local government, and non-governmental organisations. The steering group will take account of advice from the Scottish Biodiversity Forum on strategy implementation and review.



Field of oats, Mersehead

Strategy implementation plans

Detailed implementation plans will be produced on a three yearly cycle which together will underpin delivery of the strategy vision, aim and objectives. These will initially cover the following themes:

- cross-cutting issues
- interpretation, communication and education
- urban biodiversity
- rural biodiversity
- marine biodiversity
- local delivery

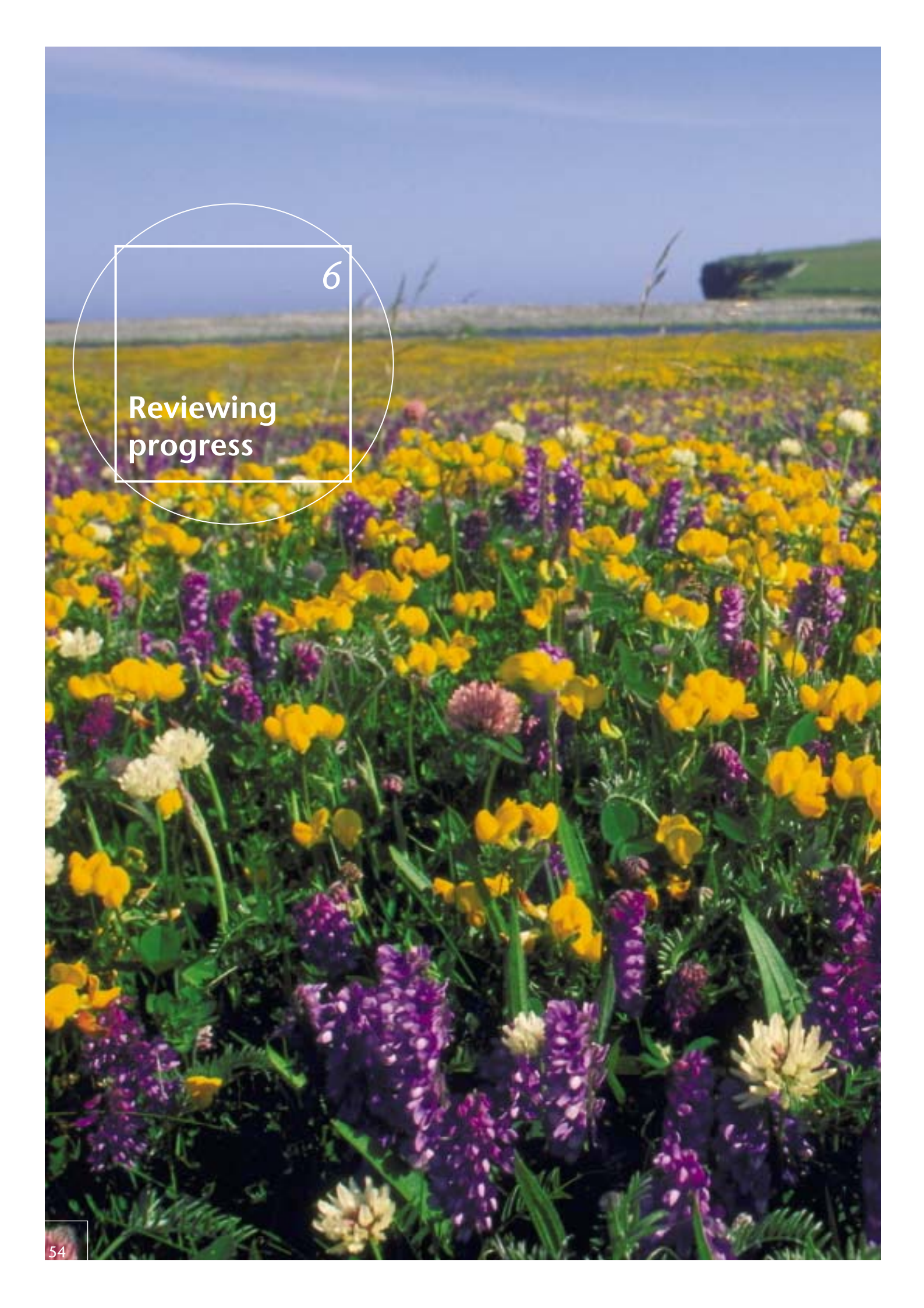
The cross-cutting issues implementation plan will address over-arching issues and issues common to the three themes, including local biodiversity, information and research, and interpretation, communication and education.

The plans will be drawn up by working groups set up by the Scottish Biodiversity Forum. The plans will include actions relating to each of the strategy objectives, and will take account of the corresponding agenda for action, bearing in mind that these are to be implemented as required to achieve the aim and objectives over a 25 year time frame. The detail and prioritisation of actions will vary between plans and from cycle to cycle as decided by the working groups. Each plan will include at least the following:

- Review of on-going actions which contribute to the strategy objectives and the UK Biodiversity Action Plan
- The specific new actions required to achieve the strategy objectives and the resources required
- Who will be responsible for those actions (stakeholders)
- Time scales on which they will be completed
- How progress on these actions will be measured (milestones and where possible indicators)

The plans will be reviewed by the Scottish Biodiversity Forum, but it will be up to the working groups to finalise their plans, identify resources and mechanisms for delivery, and where appropriate to take actions to ensure or co-ordinate delivery. Proposed actions may subsequently be refined or prioritised, with the Forum's agreement, to ensure they deliver the objectives of the strategy most effectively.

The Scottish Biodiversity Forum will also identify a list of species and habitats of particular importance for biodiversity conservation in Scotland – and which public bodies should make particular efforts to conserve.



6

Reviewing
progress

6. Reviewing progress

In this section we describe how progress towards achieving strategy objectives will be monitored and reported, the use of indicators, and how reporting procedures will be used to adjust the direction and emphasis of the implementation plans to ensure delivery of the five strategy objectives over the 25 years ahead.

6.1 The Implementation Plans

The Scottish Biodiversity Forum working groups, and any appointed sub-groups, will report every three years on the implementation status of each implementation plan. They will report on:

1. Progress in implementing specific actions, in terms of milestones achieved.
2. Tangible benefits arising from actions in terms of progress towards strategy objectives, described qualitatively, and quantitatively where appropriate measurable indicators have been identified.
3. Constraints to implementation of actions, and constraints on the contribution of actions to the strategy objectives.
4. Rationale for the follow-on implementation plan.

The working groups will take account of advice and comments from the Scottish Biodiversity Forum and the steering group in finalising their report.

6.2 The Biodiversity Strategy

The strategy implementation group, advised by the Scottish Biodiversity Forum, will prepare a report for Scottish Ministers on the implementation of the biodiversity strategy every three years. This report will draw on and summarise the implementation plan reports, and will also report progress in achieving strategy objectives at a national level, both qualitatively, and quantitatively where appropriate indicators have been identified. This report will be used as the basis for a report by Ministers to the Scottish Parliament.



Upland wet flush in the Grampian Mountains

6.3 Indicators

The Scottish Biodiversity Forum working group on indicators has identified a set of practical indicators of the state of Scotland's biodiversity, for which information is already available, and being updated on a regular basis. These indicators will allow measurement and reporting of progress in achieving the biological objectives of the strategy and measure parameters such as species populations, priority habitat and species status and species diversity. These indicators are discussed in detail in the report on indicators which accompanies this strategy.

These indicators will be further developed and refined by the Scottish Biodiversity Forum, working with those responsible for the collection of underpinning data, and will be reported and reviewed under the three-yearly reporting protocols described above. In addition, the Forum will identify a sub-set of headline biodiversity indicators for potential inclusion in Scotland's set of indicators of sustainable development.

The Forum will also work to establish a set of indicators to measure and report on our progress in achieving the social dimensions of the aim and objectives. When added to the biological indicator set, this will give the strategy a comprehensive and cost effective set of indicators to inform reporting strategy progress and achievement. The full set of indicators will then be used to inform subsequent reporting rounds.

6.4 Steering

The implementation steering group and implementation team, advised by the Scottish Biodiversity Forum, will consider all the reports outlined above, and the findings of research and analysis and will make recommendations as appropriate to Ministers, the Scottish Executive, and any other relevant body or organisation as to actions necessary to further the objectives of the strategy, take advantage of opportunities and overcome constraints. The Scottish Biodiversity Forum will also offer guidance to working groups on the development and review of the three year implementation plans.



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p 38 (bottom)

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Inside cover: 1st inset (Species and Habitats key), 2nd inset (People Key), 4th inset (Integration Key), p5, p13, p20, p45 (top)

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