

Fourth National Report to the United Nations Convention on Biological Diversity:
United Kingdom

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Executive Summary

This is the UK's fourth National Report to the Secretariat of the Convention on Biological Diversity on its implementation of the Convention. It follows the structure set out by the Secretariat and is organised into four chapters.

Chapter 1 provides a broad overview of the status and trends of UK biodiversity, summarising observed changes in species and habitats.

For a highly industrialized and populous country, with a temperate climate, the UK has a wide variety of ecosystems and species. The main factors that lead to this biodiversity are the diversity of geology, landforms and sea floors, the long history of land management, the warming effect of the Gulf Stream, and a large tidal range. These factors create:

- productive and varied seas which harbour globally significant numbers of fish, seabirds and sea mammals;
- abundant and diverse wildlife along a great length of coastline that comprise high cliffs, expanses of productive estuarine habitats on which wintering waterbirds can be found in densities as high as anywhere else in the world, and many thousands of islands;
- a patchwork mix of traditional land uses, semi natural habitats and settlements in the South and East that include important areas for biodiversity such as heathlands, bluebell woods, chalk downland, broads, fens and protected areas;
- wet oakwoods along the western seaboard, supporting endemic mosses, ferns, lichens and liverworts;
- large tracts of sparsely populated upland and mountain areas of the North and West that support many relict populations of species surviving from the last Ice Age and provide a wealth of 'ecosystem services' in the form of water provision, carbon capture in the continually forming peat and traditional practices such as grouse shooting and the distillation of whisky;
- an intricate web of freshwater habitats including rivers, lochs, freshwater lakes, waterfalls, coastal lagoons, reedbeds etc.

The species within this varied landscape are also diverse but there are relatively few species that are endemic or at high risk of global extinction. At a global scale, the IUCN Red Data Books list 51 species found within the UK that are vulnerable, endangered or critically endangered: marine fish and marine mammals are quite prominent amongst these.

Of the 1,150 species recently identified as part of the UK Biodiversity Action Plan as the priorities for national conservation action, 18% (211 species) have UK populations representing more than 25% of the total for the EU Atlantic biogeographic region. These are broken down as follows: Birds 23; Mammals 1; Invertebrates 56; Higher Plants 52; Lower Plants 71; Other 8.

The UK is fortunate in having a great deal of information about its biodiversity, collected across a broad spread of species and habitats by both professionals and amateurs for many years. These data are essential sources of evidence; for developing policies and targeting actions to conserve biodiversity; and for reporting

on progress and understanding the reasons for change and the best options for conservation.

Chapter 2 summarises the status of implementation of the UK Biodiversity Action Plan and country strategies. Following devolution and a number of other high-level drivers, a new strategic framework was published in 2007: '*Conserving Biodiversity – the UK approach*'. This new approach is based upon the twin principles of partnership and the ecosystem approach. Underpinning the UK framework are country strategies for biodiversity in each of the four countries of the UK. These include further priorities and are supported by additional measures and indicators, reflecting the countries' different priorities and means of delivery.

Chapter 3 describes how the UK Biodiversity Action Plan and the country strategies seek to promote conservation of biodiversity as a cross-government responsibility, with leadership from all departments to their stakeholders. To halt biodiversity loss, the strategies seek to make biodiversity part of the mainstream of policies and incorporate the relevant UK BAP targets at the country level. In each country there is a statutory requirement on public bodies to take account of biodiversity conservation when undertaking their functions. Chapter 3 also provides information on how biodiversity considerations are integrated into decision making, by all relevant sectors. The report does not attempt to be comprehensive; rather the text provides examples of the sorts of approach that are being taken in each country.

Implementation of the UK Biodiversity Action Plan has been very successful when resources are targeted at conserving particular species and habitats.

Chapter 4 uses a small set of biodiversity indicators to review progress in the UK towards the 2010 target and the global goals and targets agreed by the CBD. The chapter concludes with some views on the future orientation of the Convention.

The first version of the UK biodiversity indicators was published in June 2007 (www.jncc.gov.uk/biyp). The indicators were updated on the web in May 2008 and again in April 2009.

The indicators show positive outcomes for biodiversity in some areas, for example increases in populations of bats and other priority species, and plant diversity in arable fields. For other components of biodiversity such as woodland and water birds, butterflies and priority habitats, previous declines have been slowed or halted. However the indicators show continuing or accelerating declines in the populations of breeding farmland and seabirds, wintering waterbirds and plant diversity in woodland, grassland and field boundaries.

The indicators show that major efforts have been made to address the threats to biodiversity with more sustainable use of farmland, forestry and fisheries, controls on air pollution and improved water quality. However threats from invasive species have increased in marine and terrestrial ecosystems and climate change impacts on biodiversity are being observed.

The indicators show that specific actions to tackle biodiversity decline (i.e. responses) have increased, with strong positive trends in finance, volunteering and the condition of protected areas.

Taken together, we can conclude that the rapid declines in biodiversity in the UK during the last quarter of the 20th century have been substantially slowed and in some cases halted or reversed, and that efforts to address these declines through

spending and public engagement have increased. Nevertheless, it is fair to say that there is a lot more to do.

The three aims of the Convention are as critical today as they were in 1992, but the understanding of the relationship between conservation, sustainable use and access and benefit sharing, and their significance for human well-being, has developed significantly and become more widely appreciated. The Convention, and the 2010 target in particular, have been a major motivation for Parties to develop their own policies, strategies and action plans to address these aims, building on the shared experience and guidance brought together in the Programmes of Work of the Convention. The Convention has also helped to mobilise civil society and improved channels for them to communicate with governments and work in partnership to deliver shared objectives. The Convention has provided a stimulus to scientific endeavour and a focus for capacity building and transfer of resources to developing countries.

Whilst there has been substantial progress since 1992, there remain some significant issues to be addressed in improvements to the Convention:

- We need to communicate more effectively about what the Convention aims to do;
- The Parties need to agree on priorities which allow for a more concerted effort to make progress on the most important issues.
- To ensure the three aims of the Convention are met taking into account not just environmental but also social and economic issues, the ecosystem approach needs to be more widely promoted as a framework that can underpin all activities.
- More work is required to ensure that the Convention is appropriately acknowledged in other international agreements, that consistent and mutually-beneficial decisions are made, that duplication is avoided and that reporting obligations are coordinated.
- A stronger and improved interface between science and policy is needed, including the means by which SBSTTA acquires and evaluates scientific findings, support for scientific capacity building, and assessments of status and trends in biodiversity and ecosystem services.
- It is essential that there is a new global target for biodiversity that engages the public and emphasises the link between biodiversity, ecosystem services and human health and well-being, and consumption of natural resources. The new target should be challenging but achievable and capable of assessment.

After the report, appendices are presented giving:

- contact details for submission of the report and the process for its development;
- key sources of information about the UK's biodiversity;
- progress in implementing the Global Strategy for Plant Conservation;
- progress against the targets of the Programme of Work on Protected Areas;
- an overview of the UK biodiversity indicators;

- statements from some of the UK Crown Dependencies and Overseas Territories.

Chapter I - Overview of Biodiversity Status, Trends and Threats

Summary

This chapter pulls together information on the status and trends of UK biodiversity, including from the UK Biodiversity Indicators, and tries to identify the threats causing the most serious changes to UK Biodiversity. At the end of the chapter some conclusions are drawn about the major impacts on UK Biodiversity over the last 30-40 years and more recently.

1.1 Introduction

For a highly industrialized and populous country, with a temperate climate, the UK has a wide variety of ecosystems and species. The main factors that lead to this biodiversity are the diversity of geology, landforms and sea floors, the long history of land management, the warming effect of the Gulf Stream, and a large tidal range. These factors create:

- productive and varied seas which harbour globally significant numbers of fish, seabirds and sea mammals;
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- a patchwork mix of traditional land uses, semi natural habitats and settlements in the South and East that include important areas for biodiversity such as heathlands, bluebell woods, chalk downland, broads, fens and hundreds of protected natural areas;
- wet oakwoods along the western seaboard, supporting endemic mosses, ferns, lichens and liverworts;
- large tracts of sparsely populated upland and mountain areas of the North and West that support many relict populations of species surviving from the last Ice Age and provide a wealth of 'ecosystem services' in the form of water provision, carbon capture in the continually forming peat and traditional practices such as grouse shooting and the distillation of whisky;
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The species within this varied landscape are also diverse but there are relatively few species that are endemic or at high risk of global extinction. At a global scale, the IUCN Red Data Books list 51 species found within the UK that are vulnerable, endangered or critically endangered: marine fish and marine mammals are quite prominent amongst these.

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More information on the status trends and threats to UK biodiversity can be found via the links to websites listed in Box 1.

The UK has many surveillance and recording schemes that contribute information on the status and trends of biodiversity and the threats it faces (see <http://www.jncc.gov.uk/page-3713>). These schemes provide a wealth of biodiversity-related information across a broad range of terrestrial, freshwater and marine species and habitats, and provide a basis by which trends, current status of and threats to UK biodiversity can be assessed. Some of these data are fed into a suite of headline indicators which provide an overview of the state of the UK's biodiversity and the progress made towards the 2010 target (see <http://www.jncc.gov.uk/page-4229>). For certain bird and some mammal species and plankton the UK holds systematic survey data spanning 30 years or more. In addition, there is a mass of longer-term biological records, which cover many thousands of individual species across most taxonomic groups and a variety of relevant habitat types. All together, this information makes the UK one of richest nations in terms of ecological data, but it is only in relatively recent times that major efforts have been made to properly co-ordinate, collate and assess this data specifically with conservation in mind.

1.2 Political structure of the UK.

Most policy development and implementation, including nature conservation, is the responsibility of the devolved administrations for England, Northern Ireland, Wales and Scotland which collectively make up the United Kingdom of Great Britain and Northern Ireland. Figure 1 provides two maps to illustrate (a) how the area of the UK is divided between these 4 countries and (b) topography across this area.

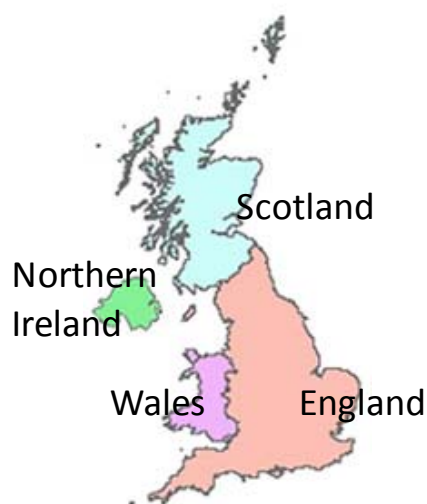
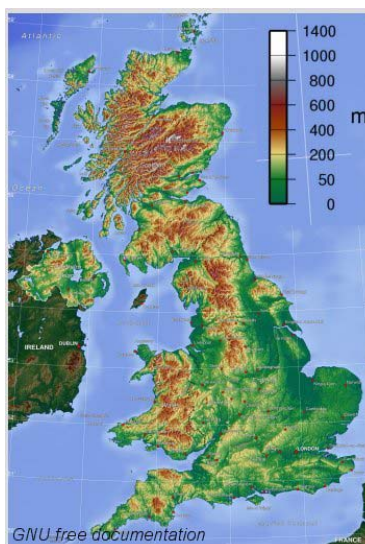


Figure 1. a) UK country boundaries.



b) Topography of the UK.

<http://www.wind-power-program.com/Pictures/Wind%20speed%20data%20images/wind%20and%20topography%20maps.jpg>

Box 1**Principal Sources of Information on the Status and Trends of UK Biodiversity**

In May 2009 the UK will commence a National Ecosystem Assessment which will establish a joined up evidence base on the status and trends in UK ecosystems and the services they support. This assessment will consider a longer list of source materials than listed here including country and local level assessments.

Surveillance and Monitoring Schemes

Overview of surveillance and monitoring supported by JNCC -

	http://www.jncc.gov.uk/page-3713
Countryside Survey -	http://www.countryside-survey.org.uk/
Tracking Mammals partnership results -	http://www.jncc.gov.uk/pdf/TMP_TMP_update_2008.pdf
Breeding birds -	http://www.bto.org/bbs/results/latest_results.htm
Seabirds -	http://www.bto.org/birdtrends2007/
Wintering waterbirds -	http://www.bto.org/webs/news/AR06_07/index.htm
Butterfly Monitoring Scheme -	http://www.ukbms.org/
Biological Records Centre –	http://www.brc.ac.uk/
UK SeaMap –	www.jncc.gov.uk/UKSeaMap
Marine Climate Change Impacts -	www.mccip.org.uk/arc
Climate Change Impacts -	http://www.ukcip.org.uk/index.php?option=com_content&task=view&id=331&Itemid=9

Status Assessments

Vascular Plant red data book -	http://www.jncc.gov.uk/page-1752
Breeding birds in the wider countryside -	http://www.bto.org/birdtrends2007/
Wintering waterbird changes in population size -	http://www.bto.org/webs/alerts/alerts/
Butterflies -	http://www.butterfly-conservation.org/text/64/butterfly_distribution.html
and -	http://www.butterfly-conservation.org/uploads/sobb2007summary.pdf

Indicators

UK 2010 indicators -	http://www.jncc.gov.uk/page-4229
BAP priority habitats -	http://www.jncc.gov.uk/page-4239
BAP priority species –	http://www.jncc.gov.uk/page-4238
Diversity of vascular plants -	http://www.jncc.gov.uk/page-4237
Trends in widespread bat populations -	http://www.jncc.gov.uk/page-4271
Trends in populations of wild birds -	http://www.jncc.gov.uk/page-4235
Trends in populations of butterflies -	http://www.jncc.gov.uk/page-4236
Extent and condition of protected areas -	http://www.jncc.gov.uk/page-4241
Spring Index -	http://www.jncc.gov.uk/page-4247

1.3 Terrestrial Habitats**1.3.1. Extent of broad habitats**

A total of 16 Broad Habitat types are recognised as the basis of a comprehensive framework for surveillance and reporting on the status of the wider UK countryside. Changes between the first countryside survey in 1998 and the third in 2007 are summarised in Table 1. The extent of five habitats (Broadleaved Woodland, three of the Grassland types and Standing Waters) increased, whereas two (Arable land and

Bracken) decreased. The remaining nine habitats showed no significant change. A number of the changes were inter-related: Broadleaved Woodland expanded due to the conversion of former areas of coniferous woodland and afforestation of farmland and the decline in Bracken was partly reflected in the increase in Acid Grassland.

Table 1. Estimated coverage (area and percentage of UK surface area) for UK Biodiversity Action Plan (BAP) Broad Habitats as recorded by Countryside Survey in 1998 and 2007¹. The final column identifies the direction of any statistically significant changes ($p < 0.05$).

	1998		2007		Change 1998-2007		Direction of significant changes
	'000 ha	% area of UK	'000 ha	% area of UK	'000 ha	%	
Arable & Horticulture	5124	21.3	4657	19.4	-467	-9.1	down
Coniferous Woodland	1448	6.0	1380	5.7	-69	-4.7	-
Bracken	318	1.3	263	1.1	-55	-17.4	down
Fen, Marsh, Swamp	479	2.0	439	1.8	-40	-8.3	-
Inland Rock	119	0.5	106	0.4	-13	-10.9	-
Rivers and Streams	70	0.3	64	0.3	0	0	-
Calcareous Grassland	63	0.3	59	0.2	-4	-6.3	-
Montane	41	0.2	42	0.2	1	2.4	-
Bog	2386	9.9	2393	10.0	7	0.3	-
Standing Open Waters	258	1.1	265	1.1	5	1.9	-
Dwarf Shrub Heath	1313	5.5	1360	5.7	47	3.6	-
Built-up Areas & Gardens	1336	5.6	1397	5.8	61	4.6	-
Acid Grassland	1516	6.3	1599	6.7	83	5.5	up
Broadleaved, Mixed & Yew Woodland	1392	5.8	1488	6.2	96	6.9	up
Neutral Grassland	2271	9.5	2407	10.0	136	6.0	up
Improved Grassland	4806	20.0	5067	21.1	261	5.4	up
Total	24017	100	24043	100			

Generally speaking, changes in the extent of BAP Broad Habitats can be seen as potentially positive in biodiversity conservation terms. The changes identified are broadly in line with conservation objectives expressed in the UK Biodiversity Action Plan. Conversion of arable and horticulture habitat to improved or neutral grassland and the increases in plant species richness within surviving arable habitats suggests that arable landscapes have generally become more diverse, with more agricultural land left unfarmed, cereal field margins and areas of neutral grassland. This should benefit farmland biodiversity. On the other hand, there is a continuing trend for 'managed' hedges to revert to relict hedges or lines of trees/shrubs, though nearly half of hedges are assessed as in good condition.

1.3.2. Extent of boundary and linear features

Much of the UK countryside is dominated by agricultural fields, which are typically bounded by lines of hedges, trees, walls, banks, grassy strips, and/or fences. Many of these linear features provide a useful habitat for a range of wildlife species and are also monitored through countryside surveys.

¹ Carey, P.D., Wallis, S., Chamberlain, P.M., Cooper, A., Emmett, B.A., Maskell, L.C., McCann, T., Murphy, J., Norton, L.R., Reynolds, B., Scott, W.A., Simpson, I.C., Smart, S.M., Uilyett, J.M. (2008) UK Results from 2007 Countryside Survey. Centre for Ecology & Hydrology. <http://www.countrysidesurvey.org.uk/>

Across Great Britain (excludes Northern Ireland), 'managed' hedgerows (excluding relict hedges and lines of trees), as recorded by Countryside Survey, showed a 6% decrease between 1998 and 2007 following a sharp decline from 1984 to 1990 and a period of stability from 1990 to 1998. A large proportion of these 'managed' hedges turned into lines of trees and relict hedges due mainly to lack of management. 'Managed' hedges have significant biodiversity benefits but continual neglect results in them having negligible value for wildlife.

1.3.3. Condition of habitats and other countryside features

Various vegetation condition measures were recorded as part of countryside surveys in Great Britain (Table 2). The suggestion is that for standing waters, neutral, improved and acid grasslands, and broad leaved woodlands, the situation is improving but that for arable lands and bracken, the situation is deteriorating. For other habitat types the picture is indeterminate or mixed.

Table 2. Summary of trends in broad habitat extent or condition from countryside survey, trends in typical species and protected area condition assessments.

Broad Habitat Type	Countryside Survey			BRC	Protected area condition		
	Change 1998-2007		Trend	Trend in typical species	% at Target value or improving		
	'000 ha	%			UK 2006	England 2008	
Arable & Horticulture	-467	-9.1	down	-4	-	-	
Coniferous Woodland	-68	-4.7	-	-37	57	98	
Bracken	-55	-17.4	down	?	-	-	
Fen, Marsh, Swamp	Upland	-40	-8.3	-	?	64	64
	Lowland					61	
Inland Rock	-30	-10.9	-	+14	74	73	
Rivers and Streams	-6	-0.2	-	?	37	28	
Calcareous Grassland	Upland	-4	-6.3	-	+3	54	90
	Lowland					70	
Montane	1	2.4	-	-5	44		
Bog	7	0.3	-	-9	69	70	
Standing Open Waters	7	1.9	Up	+9	64	66	
Dwarf Shrub Heath	Upland	47	3.6	-	-5	47	73
	Lowland					65	
Built-up Areas & Gardens	61	4.6	-	+8	-	-	
Acid Grassland	Upland	83	5.5	Up	-6	52	90
	Lowland					70	
Broadleaved, Mixed & Yew Woodland	96	6.9	Up	-1	67	83	
Neutral Grassland	136	6.0	Up	+3	68	80	
Improved Grassland	261	5.4	Up	-6	-	-	
Upland assemblages	-	-	-	-	89	-	
Saltmarsh	-	-	-	-	63	90	
Dunes, shingle and Machair	-	-	-	-	64	78	
Lowland raised Bogs	-	-	-	-	63	-	
TOTAL					66		

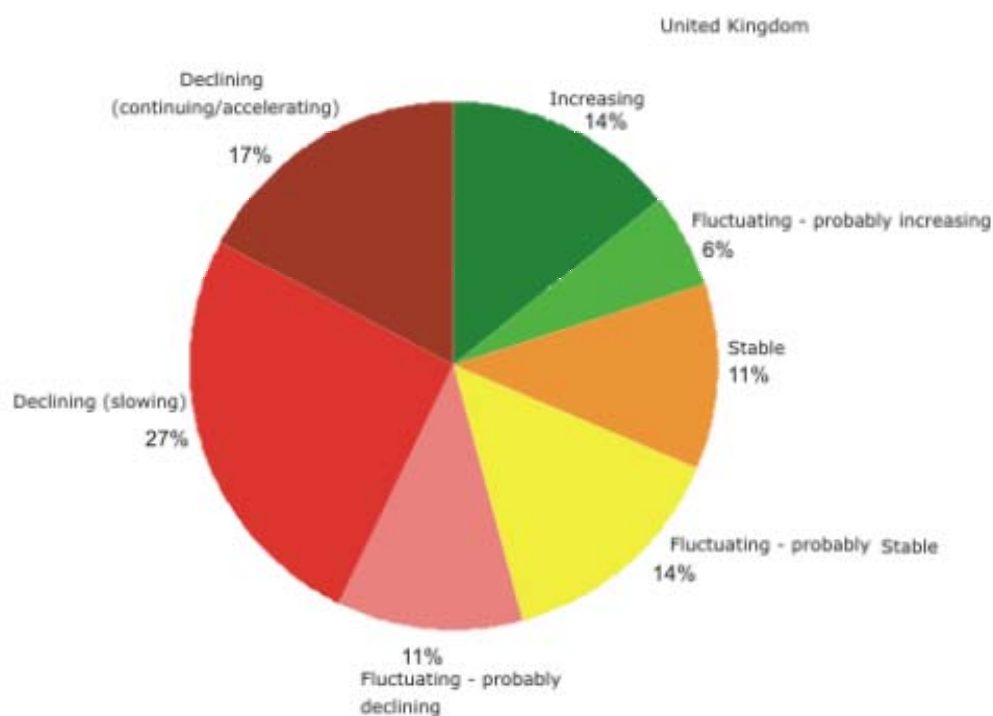
1.3.4 Trend in UK BAP habitats

Under the UK Biodiversity Action Plan a series of Priority Habitat types are recognised which cover a wide range of semi-natural habitat types that are judged to be particularly important for biodiversity conservation (see <http://www.ukbap.org.uk/NewPriorityList.aspx>).

For 43 priority habitats a status assessment is available in at least one of the three recording years between 1999 and 2008. The number of habitats assessed as either 'stable' or 'increasing' in area has fallen from 21 to 20; showing little or no change (<http://www.jncc.gov.uk/page-4239>).

There has been a limited amount of turnover of habitats over the period 1999–2008; Lowland beech and yew woodland habitats were recorded as decreasing in 2002 and increasing in 2008 while Lowland calcareous grassland and Upland calcareous grassland were both stable in 2002 but decreasing in 2008.

Figure 2 (i). Status of the UK Priority Habitats in 2008



Notes: Based on 35 habitats for which an assessment was made in 2008.
Source: Joint Nature Conservation Committee, the UK Biodiversity Partnership and Defra

Looking at the trends in more detail for 35 habitats (Figure 2 (i)), 20% were categorised as increasing or probably increasing, and 55% were assigned one of three declining categories. However, the decline was slowing for half (27%) of these habitats but for 17% decline was continuing or accelerating. The latter group were again marine or coastal habitats (Maritime cliff and slopes, Sublittoral sands and gravels, Sheltered muddy gravels, Mudflats, Coastal saltmarsh and Coastal vegetated shingle) reflecting huge pressures on this environment.

While the majority of habitats were reported in the same category in both 2005 and 2008 there was interchange among categories between reporting rounds. The largest of these changes was a movement from "unknown" to one of the known categories. For example in 2005 unknown was recorded for 11 habitats but this had

declined to 6 habitats in 2008. This change had implications across all the known categories and accounted for half of the changes to the following habitat categories; three habitats went from unknown to declining continuing / accelerating and two went from unknown to fluctuating – probably declining.

1.4 Plants and fungi

In 2004 the United Kingdom of Great Britain and Northern Ireland developed 'Plant Diversity Challenge' as its response to the Global Strategy for Plant Conservation (GSPC). This adopted all 16 of the global targets within the 5 objectives of the GSPC. This report provides an overview of progress and key successes, obstacles encountered and the needs and future priorities identified towards meeting the targets. See 'Plant Diversity Challenge – 3 years – 16 targets – 1 challenge'² for more detail about the UK's progress in implementing the GSPC.

In addition to Plant Diversity Challenge, a strategy for the conservation of the UK's fungi '*Saving the Forgotten Kingdom*' was published in 2008 by the Fungus Conservation Forum³. Plant Diversity Challenge and the UK Fungi Strategy are also supported by a 'Strategy for the conservation of lower plants and fungi in Scotland' (Long, D. and Ward, S. 2005)⁴ and 'A strategy and action plan for the conservation of lower plants and fungi in Wales' (Woods, R.G. 2009)⁵.

The revised UK BAP list (2007) includes 556 plants and fungi, equating to 48% of the total number of priority species.

In accordance with Target 5 of the Global Strategy for Plant Conservation an inventory of 150 UK Important Plant Areas (IPAs) was published in 2007. The UK IPA inventory takes account of Important Stonewort Areas (2004, Plantlife)⁶, Important Arable Plant Areas (2005, Plantlife)⁷, Important Areas for Algae (2008, British Phycological Society)⁸ and Important Plant Areas for Lichens (in press, British Lichen Society). Additional expertise and information was provided by Plantlife International, Centre for Ecology and Hydrology, Natural England, Countryside Council for Wales, Scottish Natural Heritage, Environment Heritage Service (Northern Ireland), Joint Nature Conservation Committee, National Trust, National Trust for Scotland, Natural History Museum, Royal Botanic Garden Edinburgh, The Wildlife Trusts, Botanical Society of the British Isles and the British Bryological Society.

1.4.1 Vascular Plants

The 2009 update of the biodiversity indicator (<http://www.jncc.gov.uk/page-4237>) for plant diversity in the wider countryside shows that plant species richness is

² Plantlife International, Joint Nature Conservation Committee, Royal Botanic Gardens, Kew (2007) Plant Diversity Challenge: 3 Years – 16 Targets – 1 Challenge. Progress in the UK towards the Global Strategy for Plant Conservation. Joint Nature Conservation Committee, Peterborough, UK. <http://www.plantlife.org.uk/uk/plantlife-saving-species-global-strategy-pdcc2006.html>

³ <http://www.plantlife.org.uk/portal/assets/News%20Sue%20Nottingham/Saving%20the%20forgotten%20kingdom%20PDF.pdf>

⁴ <http://www.plantlife.org.uk/uk/assets/saving-species/saving-species-publications/fungi-lower-plants-stategy-Scotland.pdf>

⁵ Woods, R.G. 2009. *A strategy and action plan for the conservation of lower plants and fungi in Wales*. Plantlife International, Salisbury

⁶ <http://www.plantlife.org.uk/uk/assets/saving-species/saving-species-publications/Important-Stonewort-Areas-summary.pdf>

⁷ <http://www.plantlife.org.uk/uk/assets/saving-species/saving-species-publications/Important-Arable-Plant-%20Areas.pdf>

⁸ <http://www.plantlife.org.uk/portal/assets/News%20Sue%20Nottingham/Algae%20IPA%20Report%20FINAL%20PDF.pdf>

increasing in arable fields but decreasing in woodlands, grasslands and boundary features.

The Botanical Society of the British Isles (BSBI) Local Change monitoring scheme provides the most recent measure of trends in vascular plant species across Great Britain (see Braithwaite *et al.* 2006)⁹. This examined change in the distribution of 726 native¹⁰ plant species between 1987-1988 and 2003-2004, based on 635 sample 2x2km survey squares (i.e. just over 1% of the land area of Britain). Sixty-six per-cent of species showed no change, 18% increased in range and 16% contracted.

The most important findings from the BSBI Local Change monitoring scheme, as revealed by a detailed analysis of the data and consideration of species-habitat relations, were:

- (i) there had been a loss of species of infertile habitats, particularly calcareous grassland and dwarf shrub heath, the main underlying cause for which may have been habitat fragmentation, although much of the fragmentation occurred some time ago and species loss continues for many reasons, such as under- and over-grazing);
- (ii) eutrophication might have been the main driving force affecting wetland habitat species, causing a reduction in plant diversity in specialised wetland habitats, although no overall change was detected amongst this species group as a whole;
- (iii) climate change appeared to one of the factors that allowed some species to increase; in particular ruderal types in urban habitats and along transport networks appeared to have been able to respond due to dispersal abilities; southern species also fared better than northern species in neutral and calcareous grassland; it nevertheless proved difficult to pinpoint cases where climate change led to losses;
- (iv) species of arable fields have suffered one of most striking declines of the 20th century. Specialist arable species continue to decline, but there was no notable decline detected in this group as a whole, partly due to an increase of these species in ruderal and disturbed habitats, but also possibly due to changes in agri-environment policies, including set-aside;
- (v) neophytes (which by their selection were likely to have spread) increased faster on average than long-established species, with greater colonisation in southern England perhaps linked to climate change and higher levels of habitat disturbance.

For the 'Vascular Plant Red Data List for Great Britain' (see Cheffings and Farrell 2005¹¹ and latest updates at <http://www.jncc.gov.uk/page-1752>), an analysis was undertaken that compared plant distribution data at the 10x10km scale from 1987-99 (based on the New Atlas of the British and Irish Flora, Preston *et al.* 2002)¹² with the same from the first nationwide survey of 1930-69. This indicated that one in five

⁹ ME Braithwaite, RW Ellis and CD Preston (2006) Change in the British Flora 1987-2004. Botanical Society of the British Isles, London.

¹⁰ Native includes archaeophyte species introduced to the UK more than 200 years ago.

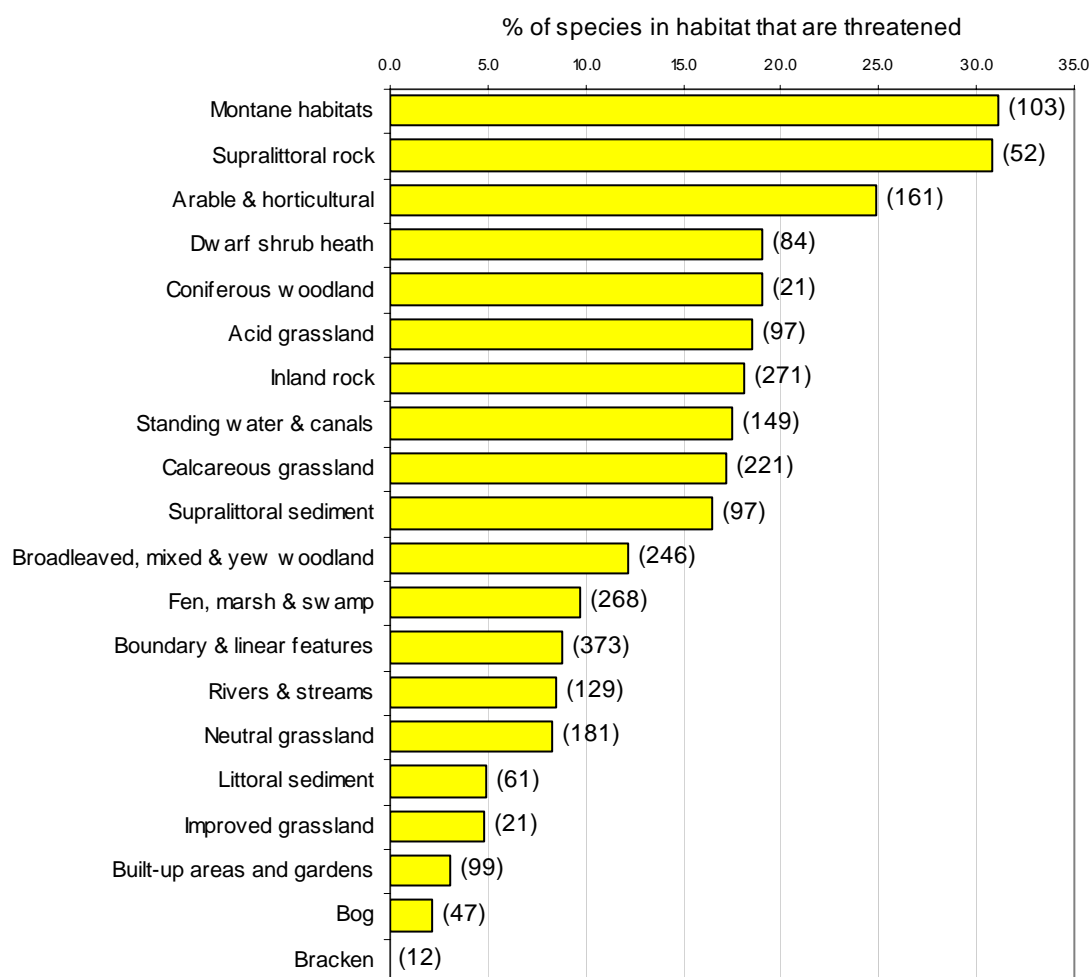
¹¹ Cheffings, C.M. & Farrell, L. (Eds), Dines, T.D., Jones, R.A., Leach, S.J., McKean, D.R., Pearman, D.A., Preston, C.D., Rumsey, F.J., Taylor, I. 2005. The Vascular Plant Red Data List for Great Britain. Species Status 7: 1-116. Joint Nature Conservation Committee, Peterborough.

¹² Preston, C.D., Pearman, D.A., Dines, T.D. (2002) New atlas of the British and Irish flora. Oxford: Oxford University Press.

native and archaeophyte species (i.e. 453 out of 2175, or 20.8%) are threatened with extinction (i.e. are Critically Endangered, Endangered or Vulnerable to extinction) and that 25% of plant species analysed (i.e. 555 out of 2175) had contracted in range longer term.

The species identified as Critically Endangered, Endangered or Vulnerable to extinction by Cheffings and Farrell (2005) can be grouped according to the Broad Habitat in which they occur. Since Broad Habitats are largely defined by their component vascular plant species, this gives an indication of the overall level of threat facing each habitat. This shows that nearly one third (31.1%) of all species of montane habitats are threatened, nearly a quarter of arable species are threatened (24.8%), and that 19% of dwarf shrub heathland species are threatened (Figure 3).

Figure 3. The proportion of vascular plant species in each Broad Habitat type that are threatened with extinction (i.e., Critically Endangered, Endangered or Vulnerable in Cheffings & Farrell, 2005). The total number of vascular plant species in each habitat is given in brackets (Dines, unpublished).



1.4.2 Bryophytes

The 'Checklist of British and Irish Bryophytes' was updated in 2008; the 'GB Bryophyte Red List' is currently under revision, and the 'Ireland Bryophyte Red list' is in its final draft form. Although as yet lacking the data to quantitatively assess trends the new bryophyte atlas project for the British Isles which has been initiated and the

continuation and increased population of the Threatened Bryophyte Database project will aim to address this. A well-organised programme of protected site monitoring for bryophytes is active in Scotland and detailed survey at the national level has been accomplished for 40 of the original 64 BAP priority species. There are 111 bryophytes included in the revised UK BAP.

Progress has also been made in developing methodologies for the *ex situ* conservation and reintroduction of bryophytes. Since 2003, 12 threatened species have been incorporated into the *ex-situ* bryophyte tissue culture collection and 8 species have been incorporated into the cryopreserved collection. Novel methods for the weaning of cryopreserved bryophyte material onto natural substrates and subsequent introduction to natural sites have been developed.

Although there are significant difficulties regarding the under-recording of bryophytes, which tends to inflate the number of apparent increases and fail to detect recent decline exist, clear trends from observation at coarser distributional levels, or through detailed study in selected priority habitats can be witnessed. These can be summarised as:

- The marked expansion particularly north-eastwards and recolonisation of urban areas by a suite of epiphytic taxa;
- A decline in acidophile and other species of specialised microhabitats, with eutrophication leading to more luxuriant but less diverse cryptogammic communities dominated by generalists;
- A decline comparable with that shown by vascular plants in some groups of arable bryophytes, e.g. Hornworts;
- Contraction in range and abundance of arctic-alpine species, particular apparent in late snow-bed communities;
- Increasing numbers and spread of invasive taxa. Few non-native bryophytes arrived before the 20th century. An increasing number of potentially invasive species have arrived as by-products of the horticultural trade (particularly that of mature tree-ferns from Australasia). The potential impacts have not been assessed.

1.4.3 Fungi

A comprehensive checklist of UK fungi and fungus-like organisms has yet to be produced, however the publication of the 'Checklist of the British & Irish Basidiomycota' is a major achievement, which will provide a sound foundation for the conservation of fungi. A strategy for the conservation of the UK's fungi *Saving the Forgotten Kingdom* was published in 2008 by the Fungus Conservation Forum¹³. There are 77 fungi included in the UK BAP.

¹³ <http://www.plantlife.org.uk/portal/assets/News%20Sue%20Nottingham/Saving%20the%20forgotten%20kingdom%20PDF.pdf>

1.4.4 Algae

A revised edition of the 'Checklist and Atlas of the Seaweeds of Britain and Ireland' was published in 2006, and a second edition of the 'Coded List of Freshwater Algae of the British Isles' was produced in 2003. There are eleven stoneworts and eight species of marine algae included in the UK BAP.

1.4.5 Lichens

Checklists of lichenised fungi and lichenicolous fungi were updated in 2002 and 2003 respectively. The Species Status Assessment project for lichens, to provide a preliminary assessment of the conservation status of UK species using IUCN criteria, is ongoing.

The British Lichen Society researched and produced Important Plant Areas for Lichens (in press), which identified 53 IPAs for lichens. This reflects the UK's international importance for lichens, especially along the Atlantic coastal region.

137 lichens are included in the UK BAP.

Lower plant and fungus conservation in Scotland and Wales is supported by 'Strategy for the conservation of lower plants and fungi in Scotland' (Long, D. and Ward, S. 2005)¹⁴ and 'A strategy and action plan for the conservation of lower plants and fungi in Wales' (Woods, R.G. 2008).

1.5 Terrestrial Mammals

Mammal status and trend information is available up to 2008 (see http://www.jncc.gov.uk/pdf/TMP_TMP_update_2008.pdf) for 35 terrestrial mammals, 54% of the UK land mammal fauna. Sixteen species, 46%, have increasing populations, and 11 species, 31%, have stable populations. Six species, 17%, are declining, and for two species the trends are unclear. Unfortunately, four of the increasing species - common rat (*Rattus norvegicus*), grey squirrel (*Sciurus carolinensis*), sika deer (*Cervus nippon*) and muntjac (*Muntiacus reevesi*) - are non-natives that cause problems for our native fauna.

Information is also available on longer term historic trends (pre 1995) and this can be estimated for a much larger number of species. Longer-term 53% (35) of species are thought to have declined including all 17 bat species in the UK. However, the 2009 update of the biodiversity indicator (<http://www.jncc.gov.uk/page-4271>) of trends in widespread bat populations, shows a very encouraging 21% increase since 2000.

Many of the causes of historic declines in mammals have now been dealt with quite effectively. Some mammals suffered heavily from persecution, particularly the carnivores and some game species, but legislation and the regulation of hunting have had positive effects on most of these species' populations. The specific threats of water pollution to otters and timber treatments to bats have also been effectively addressed with noticeable improvements to the status of the species concerned. For bats recent increases are shown in the indicator included in Chapter 4.

¹⁴ <http://www.plantlife.org.uk/assets/saving-species/saving-species-publications/fungi-lower-plants-stategy-Scotland.pdf>

Habitat loss and alien invasive species are the most obvious continuing pressures on UK mammals. Habitat loss and fragmentation are thought to be major contributors to the continuing decline or probable decline of hazel dormouse (*Muscardinus avellanarius*), water vole (*Arvicola terrestris*), hedgehog (*Erinaceus europaeus*), harvest mouse (*Micromys minutus*) and water shrew (*Neomys fodiens*) and could be a problem for other small mammal species. Red squirrel (*Sciurus vulgaris*) and water vole declines are in large part attributable to invasive alien mammals (e.g. grey squirrel (*Sciurus carolinensis*) and mink *Neovison vison*). The threat posed by a number of invasive alien mammals (grey squirrel, mink, feral cat *Felis catus*, sika deer *Cervus nippon*, muntjac *Muntiacus reevesi*) to other components of UK biodiversity is a serious problem to habitats and species alike.

At present the current or future impacts of climate change on the status of UK mammal populations is not possible to estimate but it has the potential to be high (both positive and negative) for some species in the near future.

1.6 Birds

Trends in UK breeding birds are used to compile UK biodiversity indicators for farmland birds, woodland birds, water and wetland birds and sea birds. An indicator is also calculated for wintering waterbirds. These indicators were updated in 2009 (<http://www.jncc.gov.uk/page-4235>) and the following conclusions drawn:

- Between 1970 and 2007 there was a decrease in the populations of breeding farmland, water and woodland birds of 48 per cent, 6 per cent and 21 per cent respectively. Over the same period the populations of breeding seabirds have increased by 31 per cent.
- Since 2000, the populations of breeding farmland and seabirds have fallen, whilst breeding woodland and waterbird indicators have shown little or no overall change.
- Between 1975/6 and 1996/7 wintering waterbirds increased by 66 per cent but then stabilised and subsequently fell to 57 per cent above the baseline by 2006/7.

1.6.1 Breeding Birds

Trends for each breeding bird species in the wider countryside can be found at http://www.bto.org/bbs/results/latest_results.htm. In 2007, 98 species had been recorded sufficiently for trends to be calculated with confidence for the UK and, since 1994, 44 of these (46%) had increased, 27 (27%) had decreased and 27 (27%) showed no significant trend. For 46 species trends can be calculated back to 1967 showing a similar picture with 36% (16) of species declining and 43% (20) increasing. Direct comparisons of the trends post 1967 and post 1994 should be undertaken with caution because the suite of species is different, but overall declines in birds seem to be gradually slowing.

Another notable result in 2007 was that many woodland birds have decreased since the start of the survey in 1994, but those with the most specialist habitat requirements (some of which are also long-distance migrants), have shown the most dramatic declines, notably willow tit (*Poecile montanus*, down 77%), spotted flycatcher (*Muscicapa striata*, down 59%), wood warbler (*Phylloscopus sibilatrix*,

down 57%) and pied flycatcher (*Ficedula hypoleuca*, down 54%). This is not due to loss of habitat, as overall the UK probably has more woodland now than in 1994, but the tree composition and age structure of UK woods have changed. Deer have increased in numbers, browsing away the forest under-story on which the birds depend, and forest management practices are changing the structure of woodlands.

Many of the species showing the biggest increases are also expanding across the UK, notably stonechat (*Saxicola rubicola*, up 278%), nuthatch (*Sitta europaea*, up 71%) and buzzard (*Buteo buteo*, up 56%). Buzzards are spreading from their western strongholds, stonechats are also spreading back eastwards from the temperate western coastal areas, and nuthatches, previously found only in England and Wales, are increasingly breeding in Scotland. The 2007-11 Bird Atlas, organised by BTO (with BirdWatch Ireland and the *Scottish Ornithologists' Club*), will track the geographical spread of these species, as the breeding bird survey monitors changes in numbers (see Baillie *et al.* 2007)¹⁵.

Various factors have been identified or at least suggested as likely causes of decline in particular bird species. Farmland birds have suffered particularly from agricultural intensification and specialisation, which has led to changes from spring to autumn sowing of cereal crops, changes in land use diversity at both landscape and farm scale, increases in artificial fertiliser and subsequent changes in grass and cereal sward structure, increases in livestock densities, and loss of rough grazing (Chamberlain 2002)¹⁶. These impacts might help to account for the greater decline in farmland specialist species than generalist species as concluded by the farmland breeding birds indicator. A review of possible causes of recent changes in populations of woodland birds identified seven likely contributory factors: pressures on migrants during migration or in winter; climate change on breeding grounds; reduction in invertebrates; impacts of agriculture on woodland edges and hedgerows; changes in the management of woodland; intensified pressure from deer leading to changes in woodland structure; and changing predation pressure (squirrels and corvids) (Vanhinsbergh *et al.* 2002)¹⁷.

1.6.2 Seabirds

Information collected for Operation Seafarer, the Seabird Colony Register Census and Seabird 2000 has been used to construct trends in the abundance of 21 UK breeding seabird species from 1969-70 and 1985-88 to 1998-2002 (see Mitchell *et al.* (2004)¹⁸. The results are summarised in Table 3. In only two species (roseate tern *Sterna dougallii* and coastal colonies of herring gull *Larus argentatus*) in 1969-70 were sizeable long-term declines recorded, whereas seven other species returned increases of more than 50%. More recent trends, recorded from 1985-88 to 1998-2002, included five species with losses of 25% or more. Amongst these were

¹⁵ Baillie, S.R., Marchant, J.H., Crick, H.Q.P., Noble, D.G., Balmer, D.E., Barimore, C., Coombes, R.H., Downie, I.S., Freeman, S.N., Joys, A.C., Leech, D.I., Raven, M.J., Robinson, R.A. and Thewlis, R.M. (2007) Breeding Birds in the Wider Countryside: their conservation status 2007. BTO Research Report No. 487. <http://www.bto.org/birdtrends2007/>

¹⁶ Chamberlain, D.E. (2002) Effects of agricultural intensification on birds: evidence from monitoring data. *Aspects of Applied Biology* 67, 1-10.

¹⁷ Vanhinsbergh, D., Fuller, R.J. and Noble, D. (2002) A review of possible causes of recent changes in populations of woodland birds in Britain. BTO Research Report No. 245.

¹⁸ Mitchell, P.I., Ratcliffe, N., Newton, S. and Dunn, T.E. (Eds.) (2004) Seabird Populations of Britain and Ireland. A&C Black, London.

the roseate tern, which declined most severely, and the black-legged kittiwake (*Rissa tridactyla*) and European shag (*Phalacrocorax aristotelis*), which also showed (slight) declines over the whole study period. Mitchell *et al.* (2004) reported that the dramatic decline in the roseate tern during the 1970s and early 1980s is likely to have been due to poor immature survival rates (which may have been partially attributable to deliberate trapping in the Ghanaian wintering grounds). Factors such as predation and nesting habitat loss (due to erosion, competition with gulls and/or disturbance) may have also played a role. The species has probably always been rare and localised owing to its specialised foraging and nesting habitat requirements, and was driven to the brink of extinction by exploitation for the millinery trade during the 19th century, before recovering through the early 20th century as a result of protective legislation and management.

Table 3. Trends in the abundance of UK breeding seabirds from 1969-70 and 1985-88 to 1998-2002. Values given are % change and are based on coastal colonies only. The species are ranked according to their overall change and declines of 25% or more are highlighted (grey shade). Virtually all species are included in the seabird population trend biodiversity indicator (see <http://www.jncc.gov.uk/page-4235>). Taken from Mitchell *et al.* (2004) and derived from data collected for Operation Seafarer (1969-70), the Seabird Colony Register Census (1985-88) and Seabird 2000 (see <http://www.jncc.gov.uk/page-1548>).

		% change to 1998-2002	
		since Operation Seafarer conducted in 1969-70	since the Seabird Colony Register conducted in 1985-88
Roseate tern	<i>Sterna dougallii</i>	-94	-83
Herring gull*	<i>Larus argentatus</i>	-53	-12
Great black-backed gull	<i>Larus marinus</i>	-9	-3
Black-legged kittiwake	<i>Rissa tridactyla</i>	-7	-25
European shag	<i>Phalacrocorax aristotelis</i>	-7	-25
Common tern	<i>Sterna hirundo</i>	-1	-10
Arctic tern	<i>Sterna paradisaea</i>	4	-31
Black-headed gull*	<i>Larus ridibundus</i>	5	0
Sandwich tern	<i>Sterna sandvicensis</i>	13	-15
Little tern	<i>Sterna albifrons</i>	21	-24
Great cormorant*	<i>Phalacrocorax carbo</i>	21	10
Atlantic puffin	<i>Fratercula arctica</i>	37	19
Razorbill	<i>Alca torda</i>	43	22
Common gull*	<i>Larus canus</i>	70	36
Northern fulmar	<i>Fulmarus glacialis</i>	73	-3
Lesser black-backed gull*	<i>Larus fuscus</i>	84	41
Northern gannet	<i>Morus bassanus</i>	95	40
Arctic skua	<i>Stercorarius parasiticus</i>	106	-37
Common guillemot	<i>Uria aalge</i>	136	31
Great skua	<i>Stercorarius skua</i>	213	26
Black guillemot	<i>Cephus grylle</i>	not recorded	3

* species has a sizable independent inland population which was not surveyed during Operation Seafarer (1969-70) or the Seabird Colony Register Census (1985-88); the trend given relates to coastal colonies only

1.6.3 Wintering Waterbirds

Trends in the abundance of non-breeding wintering waterbirds have been recorded across Great Britain under the Wetland Bird Survey (WeBS) (see Maclean and Austin 2008)¹⁹. These are summarised in Table 4. For most species long-term trends are available over 25 years from winter 1978/79 to winter 2003/04. A few others only have trend data spanning 15-18 years. Of the 39 species recorded, only two (European white-fronted goose *Anser albifrons albifrons*, purple sandpiper *Calidris maritima*) declined overall by 50% or more, and only one other (mallard *Anas platyrhynchos*) declined by more than 25%. This compares with 14 species whose population increased by over 50%: the remaining species were relatively stable.

Table 4. Trends in the abundance of wintering waterbirds across Great Britain from winter 1978/79 (or the first recording thereafter) to winter 2003/04. Values given are % change in each species to 2003/04 over the previous 5, 10 and 25 years (or maximum number of years available if data collected for less than 25 years). Species are ranked according to their overall change. Virtually all are included in the wintering waterbirds population trend biodiversity indicator (see <http://www.jncc.gov.uk/page-4235>). Derived from Wetland Bird Survey data as reported in Maclean and Austin (2008)²⁰.

		% change to 2003/04		
		over previous 25 years (or maximum available as stated)	over previous 10 years	over previous 5 years
European white-fronted goose	<i>Anser albifrons albifrons</i>	-63	-45	-42
Purple sandpiper	<i>Calidris maritima</i>	-51	-39	-19
Mallard	<i>Anas platyrhynchos</i>	-32	-13	-5
Shelduck	<i>Tadorna tadorna</i>	-20	-17	-11
Pochard	<i>Aythya ferina</i>	-19	-19	-20
Dunlin	<i>Calidris alpina</i>	-16	-16	-12
Pintail	<i>Anas acuta</i>	-16	17	12
Scaup	<i>Aythya marila</i>	-15	18	0
Ringed plover	<i>Charadrius hiaticula</i>	-14	-18	-11
Sanderling	<i>Calidris alba</i>	-13	14	-11
Turnstone	<i>Arenaria interpres</i>	-12	-25	-14
Eider	<i>Somateria mollissima</i>	-1	10	0
Bar-tailed godwit	<i>Limosa lapponica</i>	2	11	1
Red-breasted merganser	<i>Mergus serrator</i>	15	-26	-23
Oystercatcher	<i>Haematopus ostralegus</i>	17	0	-1

¹⁹ Maclean, I.M.D. and Austin, G.E. (2008) Wetland Bird Survey Alerts 2004/2005 (Release 2): Changes in numbers of wintering waterbirds in the Constituent Countries of the United Kingdom, Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs). BTO Research Report 492. <http://www.bto.org/webs/alerts/alerts/>

²⁰ Maclean, I.M.D. and Austin, G.E. (2008) Wetland Bird Survey Alerts 2004/2005 (Release 2): Changes in numbers of wintering waterbirds in the Constituent Countries of the United Kingdom, Special Protection Areas (SPAs) and Sites of Special Scientific Interest (SSSIs). BTO Research Report 492. <http://www.bto.org/webs/alerts/alerts/>

	% change to 2003/04		
	over previous 25 years (or maximum available as stated)	over previous 10 years	over previous 5 years
Dark-bellied brent goose <i>Branta bernicla bernicla</i>	19	-29	-15
Coot <i>Fulica atra</i>	20 ^(18 years)	16	2
Tufted duck <i>Aythya fuligula</i>	20	20	7
Shoveler <i>Anas clypeata</i>	26	11	-2
Redshank <i>Tringa totanus</i>	27	10	2
Knot <i>Calidris canuta</i>	29	-4	9
Goldeneye <i>Bucephala clangula</i>	32	-7	-14
Bewick's swan <i>Cygnus columbianus</i>	38	-12	-3
Great crested grebe <i>Podiceps cristatus</i>	45 ^(18 years)	13	5
Curlew <i>Numenius arquata</i>	48	-1	-7
Goosander <i>Mergus merganser</i>	53	-11	-26
Teal <i>Anas crecca</i>	54	16	3
Wigeon <i>Anas penelope</i>	55	25	13
Cormorant <i>Phalacrocorax carbo</i>	60 ^(15 years)	25	16
Common scoter <i>Melanitta nigra</i>	98	170	134
Grey plover <i>Pluvialis squatarola</i>	144	-18	-15
Lapwing <i>Vanellus vanellus</i>	144	-6	-2
Little grebe <i>Tachybaptus ruficollis</i>	147 ^(15 years)	58	25
Whooper swan <i>Cygnus cygnus</i>	220	167	57
Golden plover <i>Pluvialis apricaria</i>	243	67	20
Light-bellied brent goose* <i>Branta bernicla hrota</i>	256	92	66
Black-tailed godwit <i>Limosa limosa</i>	389	132	54
Gadwall <i>Anas strepera</i>	426	79	18
Avocet <i>Recurvirostra avosetta</i>	3567	156	47

* Svalbard population

The more recent trend information, i.e. that over 5-10 years prior to 2003/04, revealed that virtually all species that declined overall suffered lower or, at least, similar rates of decline in more recent times: for a few of these species their populations actually increased (particularly pintail *Anas acuta*). Nevertheless, the rate of decline in the European white-fronted goose remained at over 40%, and a good many species declined by 10-30% over one or more of the periods (albeit that the population of some of these increased overall, e.g. dark-bellied brent goose *Branta bernicla bernicla*, goldeneye *Bucephala clangula*, goosander *Mergus merganser*, red-breasted merganser *Mergus serrator*). Further declines in European white-fronted goose have been recorded, such that numbers in winter 2006/07 were the lowest level ever recorded. This appears to be partly related to a decline in breeding success (possibly due to increased rodent predation in its Arctic breeding grounds), but a continuing shift of the wintering range eastwards onto the European continent due to milder winter weather is likely to be the most important factor driving this change (see Austin *et al.* 2008)²¹.

²¹ Austin, G., Collier, M., Calbrade, N., Hall, C. and Musgrove, A. (2008). Waterbirds in the UK 2006/2007: The Wetland Bird Survey. BTO/WWT/RSPB/JNCC. http://www.bto.org/webs/news/AR06_07/index.htm

1.7 Freshwater Fish

Fish populations, together with the fisheries they support, are of enormous environmental, social and economic value. Fish are indicators of the health of our freshwater environment, and both angling and net fishing contribute substantially to the economy.

In general fish stocks are encouraging, although there are some specific concerns. A survey in 2007 revealed that coarse fish numbers in England and Wales are increasing and are a big improvement on a decade ago, when many rivers were grossly polluted with their fish communities restricted to just a few fish of limited species. Fish were present at 98% of sites, with 50% of sites containing more than 8 species. Salmon (*Salmo salar*) stocks continue to be in a depleted state. However, there has been some improvement on 10 years ago following the instigation of Salmon Action Plans in 1996 and even stocks on previously polluted rivers, including the Tyne and rivers of the South Wales Valleys, have recovered dramatically. Sea trout (*Salmo trutta*) stocks are generally stable. Eel (*Anguilla anguilla*) stocks are critically low. The International Council for the Exploration of the Sea (ICES) has declared that the European eel stock is outside safe biological limits and the current fishery is not sustainable. EU Ministers agreed a recovery plan for the European eel in September 2007; in conformity with the Regulation, the UK is currently in the process of drawing up Eel Management Plans for each River Basin District in the UK. However, it is a long-term plan and recovery is not expected to be achieved for 2-3 eel generations (60-80 years).

Protecting native fish species is of vital importance. Continued access to varied and disease free fisheries is vital to the four million practising anglers. Healthy fisheries are an important indicator of the state of rivers and the absence of non-native species is a key requirement for attaining good ecological status under the Water Framework Directive.

Key to this is controlling the spread of non-native fish. Non-native fish species can pose a serious threat to our native fisheries - for example by predation, or can upset the natural balance that operates between native species. The Import of Live Fish Act 1980 (ILFA) prohibits the keeping or release of certain species in any water (including tanks and ponds) without a licence. In addition the Salmon and Freshwater Fisheries Act 1975 requires that those who introduce fish into inland waters seek the prior consent of the Environment Agency. These two pieces of legislation are being amended through the Alien Species Regulation (EC 708/2007) and by framework powers proposed in the Marine and Coastal Access Bill to ensure there are robust controls on the removal, keeping and introduction of all live fish.

1.8 Butterflies

The 2009 update of the biodiversity indicator (<http://www.jncc.gov.uk/page-4236>) showing trends in populations of butterflies concluded that, since 1976, the measures for populations of specialists and generalists show apparent declines of

70 per cent and 45 per cent respectively. The decline for specialist species is statistically significant.

There are two principal sources for butterfly trends across the UK: (i) the UK Butterfly Monitoring Scheme (BMS, see <http://www.ukbms.org/>), which started in 1976 and records trends in abundance for 33 species; and (ii) the Butterflies for the New Millennium project (BNM, see http://www.butterfly-conservation.org/text/64/butterfly_distribution.html), under which butterfly records since the 1970s have been analysed. The most recent results from these schemes have been summarised in a report on the state of Britain's butterflies (see Fox *et al.* 2007)²².

From 1995-2004 trends (annual rates of population change) have been calculated for 49 butterfly species. Of these, 24 (49%) have declined by >25%. This is more than in any other taxonomic group for which data is available. The largest declines have been for high brown fritillary (*Argynnis adippe*), Duke of Burgundy (*Hamearis lucina*) and silver studded blue (*Plebejus argus*), despite the conservation attention they all receive through being Biodiversity Action Plan priority species. Over the same time period 11 (22%) species increased by the same amount.

Longer-term trends are very similar to the 10 year trends with 20% of species declining at a rate >25% in 25 years and 22% of species increasing by the same amount or more. Between the 1970s and 2004, the large blue (*Maculinea arion*) went extinct and 76% of the remaining 54 resident species suffered decreases in distribution. Six species lost more than 50% of their distribution and a further 15 lost more than 30% of range. In terms of depletion of population size, 54% of species have suffered declines; which have been most pronounced for marsh fritillary (*Euphydryas aurinia*) and heath fritillary (*Mellicta athalia*).

Despite the generally negative picture for butterflies, there have been a few very noteworthy conservation successes including the reintroduction of the large blue, increases in Adonis blue (*Polyommatus bellargus*) and a spectacular 1,500% increase in silver spotted skipper (*Hesperia comma*). Most other increases are thought to be a result of northward expansions induced by climate change. The Essex skipper (*Thymelicus lineola*) has expanded its range 46% since the 1970s and recently colonised Wales. Some other wider countryside species have also benefited including comma (*Polygonia c-album*), brown argus (*Aricia agestis*), orange-tip (*Anthocharis cardamines*) and peacock (*Inachis io*).

The most prevalent cause of decline for butterflies is thought to be habitat loss and deterioration. Loss of post-industrial 'brownfield' sites and bogs in addition to a departure from traditional land management practices for grasslands and woodlands have all been associated with particular butterfly declines. Habitat fragmentation is a specific form of habitat loss causing problems for butterfly species such as marsh fritillary (*Euphydryas aurinia*), heath fritillary (*Mellicta athalia*), high brown fritillary (*Argynnis adippe*), pearl bordered fritillary (*Boloria euphrosyne*) and small pearl bordered fritillary (*Boloria selene*). The latest butterfly atlas showed that the recent distributions (up to 1999) of most habitat specialist butterflies have declined, while

²² Fox, R., Warren, M.S., Asher, J., Brereton, T.M. and Roy, D.B. (2007) The state of Britain's butterflies 2007. Butterfly Conservation and the Centre for Ecology and Hydrology, Wareham, Dorset. <http://www.butterfly-conservation.org/uploads/sobb2007summary.pdf>

the distributions of most wider countryside species have expanded (largely due to climate changes) or remained stable.

1.9 Moths

New data has been obtained from the report by Butterfly Conservation and Rothamsted Research in 2006, entitled 'The State of Britain's Larger Moths' (Fox et al. 2006)²³ and supplemented by more detail behind the report published in Biological Conservation (Conrad et al. 2006)²⁴.

Longer-term, over the 35 years from 1968 to 2002, 226 of 337 species (approximately two thirds) declined. Of these 192 species have declined by more than 25% and 132 by more than 50%. Very worryingly 8 species have declined by 95% or more between 1968 and 2002. These are dusky thorn (*Ennomos fuscantaria*, -98%), hedge rustic (*Tholera cespitis*, -97%), v-moth (*Macaria wauaria*, -97%), double dart (*Graphiphora augur*, -97%), garden dart (*Euxoa nigricans*, -97%), grass rivulet (*Perizoma albulata*, -96%), dark spinach (*Pelurga comitata*, -96%), spinach (*Eulithis prunata*, -96%), and figure of eight (*Diloba caeruleocephala*, -95%). Some of these, such as the figure of eight were very numerous widespread species towards the beginning of their decline.

In the twentieth century 62 moth species went extinct in the UK and declines of this extent suggest that extinctions are likely to continue into the 21st century. Declines across so many species of such an abundant widespread group as the larger moths must start to raise concerns about secondary impacts on the ecosystem functions and habitats of which these moths are a part. As yet these secondary effects have not been quantified. There is however some good news, in that 46 species have more than doubled their population size since 1968, and a further 23 species have increased by more than 50%.

The declines are more pronounced in the south and especially the south-east and thought to be due mainly to habitat loss and possibly climate change. Habitat loss is hard to link explicitly to declines but loss of hedgerows, destruction of field margins and improvements to pasture land are thought to be particularly important factors. The evidence is growing. For example, there is reasonably strong evidence that a flexible life cycle benefits moths as only those species that overwinter as adults or emerge during winter have been able to increase on average and those that overwinter in the egg stage (the least flexible stage of the life cycle) have done particularly badly on average. There are also many North-South and East-West changes that suggest climatic influence.

The reasons for increase are perhaps even more difficult to determine. Climate change is again likely to be important and it is noticeable that those species that feed on lichen, algae and conifers have done particularly well.

²³ Fox, R., Warren, M.S., Asher, J., Brereton, T.M. and Roy, D.B. (2007) The state of Britain's butterflies 2007. Butterfly Conservation and the Centre for Ecology and Hydrology, Wareham, Dorset. <http://www.butterfly-conservation.org/uploads/sobb2007summary.pdf>

²⁴ Conrad, K.F., Warren, M.S., Fox, R., Parsons, M.S., and Woiwod, I.P. (2006) Rapid declines of common, widespread British moths provide evidence of an insect biodiversity crisis. *Biological Conservation* 132, 279-291.

1.10 Biological Recording

Biological recording data is relatively comprehensive at the simplest level in that it exists for many thousands of species in most taxonomic groups such as lower plants, beetles, spiders etc, and has almost blanket coverage. The uses to which it can be put are however more limited than the more systematic surveys but has improved through the development of novel analytical techniques, including modelling.

One of the new techniques, developed recently within Joint Nature Conservation Committee, involves fitting environmental niche models to the biological recording data. For 137 species including dragonflies, hoverflies, ground beetles and spiders, these models fitted well enough to give meaningful results. For the 137 species modelled it is then possible to estimate the main environmental variables that account for the predicted distribution. The results show that climate variables account for 55% of distribution, land use 25% and a combination of climate and land use 20%. This leads to a general conclusion that change in climatic variables would lead to changes in the distribution of between 55% and 75% of UK species if these 137 are representative of biodiversity as a whole. This is an alarming statistic when taken in conjunction with climate change statistics and given that climate change will also have knock on effects to land use which could then increase the impacts on species further.

Long-term, 16% of 4,822 species assessed are declining. 20% of 1,288 species assessed have declined over the last 10 years. This suggests that declines have not yet been halted or reversed. In terms of the 2010 targets, this means that for species the UK is some way from meeting the EU target to halt biodiversity loss and unable to report how close the UK is to meeting the global target of significantly reducing the rate of biodiversity loss by 2010. For those species, such as birds and mammals for which longer-term trend data exist there are indications that historic declines have started to stabilise and in some cases reverse but this might not be the case for all taxonomic groups. Some species are however doing well as 20% have increased long-term.

1.11 Biodiversity Action Plan (BAP) species

The UK list of priority species was thoroughly reviewed in 2007 and now contains many more species than the previous list. For the sake of comparison with the last reporting in 2005, the 2008 reporting, which gives rise to the data presented below, was restricted to the same suite of species for which data was reported in 2005.

There has been very little change in the trends for UK BAP species since 2005. Of the 339 species used in the UK indicator (<http://www.jncc.gov.uk/page-4238>), the number that were assessed as either 'stable' or 'increasing' has risen from 202 to 214. This modest improvement is a positive trend, although there has been a slight fall in the number of species actually 'increasing' (from 48 to 45). In addition, in 2008, 88 species were still declining and 6 were recorded as lost from the UK. The ongoing increase in number of species reported as lost, which came from the declining and unknown categories in 2005 is an additional cause for concern.

Although the indicator shows a small net increase in the number of species that are stable or increasing, and the majority of species were reported in the same

assessment category in both 2005 and 2008, there has been some turnover of species over the period 1999 – 2008.

In broad terms, the number of species that have moved from the decreasing category to 'stable' or 'increasing' outweighs those moving in the other direction, but there are no obvious patterns in these changes. Sixty six of the species that were declining in 2008 were also declining in 2005. Six species changed from declining in 2005 to lost in 2008. Species that have moved from 'decreasing' in 2002 to either 'increasing' or 'stable' in 2008 include the shrill carder bee (*Bombus syvarum*), great yellow bumblebee (*Bombus distinguendus*), reed bunting (*Emberiza schoeniclus*) and the heath tiger beetle (*Cicindela sylvatica*). Very few species have moved from 'increasing' to 'declining' although there are some examples: Newman's lady fern (*Athyrium flexile*) and fen orchid (*Liparis loeselii*).

Looking at the 2008 trends in more detail (Figure 4 (i)), 31% of the UK BAP priority species continue to decline, but for 10% this decline appears to be slowing. This still leaves 11% of species for which more than 10 years of UK BAP priority action has been insufficient to slow the decline. The result indicates the enormity of the threat faced by UK's most threatened species.

There are however positive signs. The number of increasing species has remaining more or less similar to that reported in 2005, more species are being recorded in the 'stable' category and fewer species (88) are declining in 2008 compared to 2005 when there were 102 species declining. Over 60% of species fall into the 'increasing' or 'stable' categories.

Overall the trend during the 2002, 2005 and 2008 reporting periods looks positive with a decline in the number of species that are decreasing (Figure 4 (ii)).

Figure 4 (i). Status of UK Priority Species in 2008

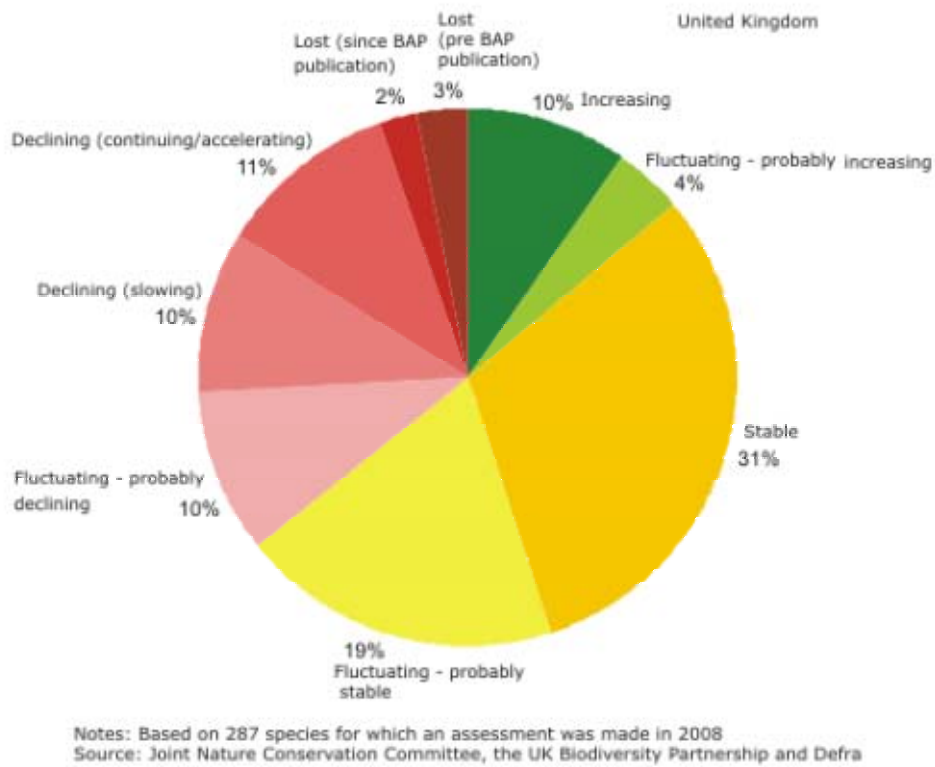
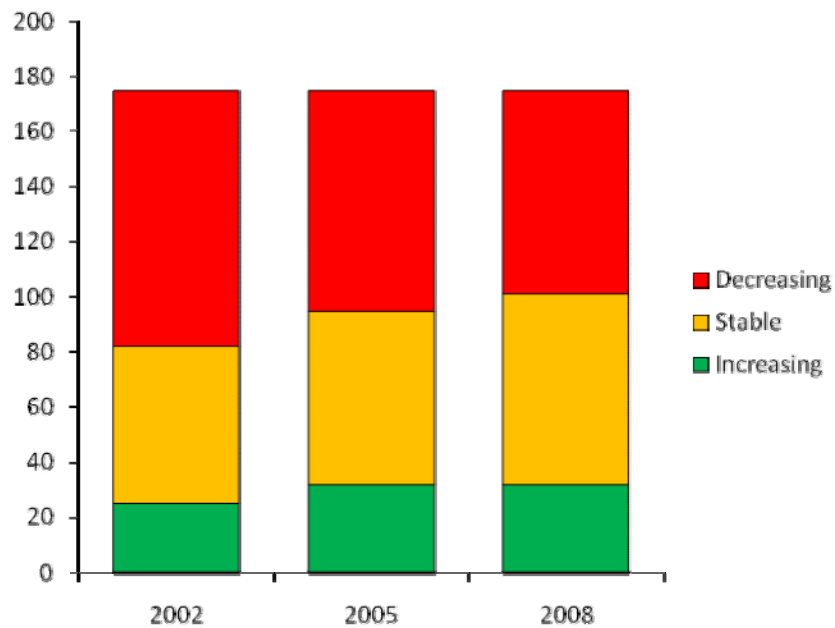


Figure 4 (ii) Changes in the status of the UK priority species, for 175 species that have been assessed in all recording years 2002-2008



1.12 Protected areas

Common Standards Monitoring of designated sites reported the UK results of its first six year cycle in June 2006. The sites covered by the monitoring exercise cover 10% of the land area of the UK (2.4 million hectares) and consequently support a very significant share of UK's most important biodiversity. The total area of land and sea covered by the site series is now 3.5 million hectares compared to 2.3 million hectares in 1998. The recent trend in extent of protected areas is shown in the 2009 biodiversity indicators update (<http://www.jncc.gov.uk/page-4241>).

For each site there are 1 or more biodiversity features for which the site is protected and each of these are assessed independently. Of the 10,560 biological features assessed in 2006, 68% were either in favourable condition (49%) or recovering towards favourable (19%). 1% had unfortunately been irretrievably lost from the site.

For habitat features, results indicated that some 42% are in favourable condition, with a further 24% showing signs of recovery from an unfavourable state. Only some 13% of habitat features had been assessed as declining although this may be an underestimate. Comparing types of habitat features, Acid Grassland, Calcareous Grassland, Dwarf Shrub Heath and Rivers/Streams seemed to be faring relatively badly, while Inshore Sublittoral Sediments, Littoral Sediment, Littoral Rock, Supralittoral Rock and Mosaics seemed to be doing better.

For species features, considerably fewer had been assessed than for habitat features, but, of these, 68% were in favourable condition.

The 2009 update of biodiversity indicators (<http://www.jncc.gov.uk/page-4241>) includes new baseline figures for the percentage of biological features or sites in favourable or recovering condition. While these country figures are not directly comparable with the UK figures from 2006 they do suggest that the condition and management of protected sites is slowly improving.

1.13 Marine Nature

1.13.1 Introduction

The reports '*Charting Progress: an Integrated Assessment of the State of UK Seas*' and '*Review of Marine Nature Conservation - Working Group report to Government*' summarise what is known about the state of the UK marine biodiversity. Additionally, the Marine Climate Change Impacts Partnership (MCCIP) has produced an Annual Report Card for 2007-2008 (www.mccip.org.uk/arc) which has been incorporated into the following text. The second edition of Charting progress is currently being produced for publication in 2010 and will provide a complete update of the state of marine environment in the UK.

1.13.2 Plankton

The Continuous Plankton Recorder survey has been operating in UK waters for over 70 years. Results from the survey, run by Sir Alister Hardy Foundation for Ocean Science (SAHFOS), indicate that major biological changes have taken place in the plankton around the British Isles in recent decades with a pronounced shift occurring after the mid-1980s that is reflected in the plankton, nutrients and current fluxes. A northerly movement of warmer-water plankton by 10° latitude (1,000km) over the

last 50 years has been recorded, and a similar retreat of colder water plankton to the north. There has been an increase in the flow of warmer-water into the North Sea. Marine ecosystems around the UK appear to have moved into a warmer dynamic regime that may be leading to a greater transport of dead planktonic material to the benthos and faster carbon turnover. The change in plankton composition is likely to adversely affect cod (*Gadus morhua*) breeding and stocks in UK waters.

1.13.3 Marine habitats

Marine habitats have been classified in broad terms by UKSeaMap (www.jncc.gov.uk/UKSeaMap; Connor et al. 2006). The marine seabed area under UK jurisdiction extends to circa 871,900 km². UKSeaMap identified seabed habitat types in three main categories: i) coastal features, ii) continental slope and deep sea topographic and bed-form features, iii) substrate features.

Coastal features make up a small proportion of the total. Bays comprise 0.6% of the UK marine area, estuaries 0.3%, and sealochs 0.3%. The remaining coastal features each make up 0.1% or less of the total.

As a proportion of the total, continental slope and deep sea topographic and bed-form features are more extensive. Deep ocean rises (typically rock) comprise 10.1% of the UK total, the continental slope (mainly sediment) 4.2%, and shelf troughs (mainly sediment) 0.7%. No other feature in this category exceeds 0.2% of the UK area. Substrate features comprise the largest component of the UK marine area. Sand plains make up 31.6% of the total area, coarse (gravel) sediment plains 17.3%, mud plains 15.1% and mixed sediment plains 2.6%. Rock substrates comprise 2.1% of the total.

Trends in the biological status of these habitats are uncertain, but repeated bottom trawling, as occurs in the parts of the North Sea and the Irish Sea, is considered to have altered the characteristic benthic communities. At the moment, there are no national surveillance programmes capable of reporting on the status and trends of UK marine habitats. However new systematic assessment processes have been trialled in 2008, and a UK marine biodiversity surveillance strategy is being developed to encompass existing and emerging policy requirements, including EC Directives.

The status of the estimated 7,300 species of marine invertebrates and macro-algae has not been comprehensively documented, and for most species is insufficiently known to assist in reporting on marine habitats.

Non-native marine species are an increasing threat to marine habitats primarily due to rising sea temperature and continued influx by shipping and other vectors. Cambridge University and SAHFOS note that new marine life is arriving into our waters both by migration and by human introduction. The number of different non-native species is increasing in marine habitats and some are causing major ecological changes. Distributions of non-native species are currently limited by water temperature so warmer UK waters over the last three decades are facilitating the establishment of some of these species. This climate change effect also applies to native species of rocky shores and probably other habitat types as well if these had been investigated. The Marine Biological Association (MBA) and Marine Environmental Change Network (MECN) report that warm-water species on rocky shores in the UK have increased in abundance and range with rising temperatures

(e.g. purple acorn barnacle, *Balanus amphitrite*, has extended its range by 170 km since the mid 1980s), whilst northern, cold-water species (e.g. common tortoiseshell limpet, *Tectura testudinalis*) have decreased in abundance.

Some marine habitats are monitored within marine protected areas. Table 5 lists the percentage of each marine habitat type at or approaching the target value for condition and extent within marine protected areas of the UK. In general marine habitat features were in more favourable condition than terrestrial habitat features within the UK protected area network.

Table 5. Condition of marine habitat features assessed under protected area monitoring.

	% at or approaching target value
Rocky shores, reefs and caves	82.6%
Sea cliffs	76.1%
Intertidal sands and muds	75.7%
Subtidal sandbanks	66.7%
Lagoons	83.0%

1.13.4 Marine mammals

Twenty-eight species of cetaceans have been recorded from UK waters in the latter part of the 20th century and 11 of these are recorded frequently, the remainder intermittently. The large whales include some of the most globally threatened species and for some of these their population status is unknown. For the smaller cetaceans, the latest large scale survey (SCANS II) provided the first comprehensive estimates of abundance in the West European Atlantic continental shelf region. For most species, no significant changes were observed since the previous SCANS 1994 survey. Many cetacean species, particularly common dolphins (*Delphinus delphis*) and porpoises (*Phocoena phocoena*), are subject to incidental captures in fisheries in UK waters. A conservation strategy is being implemented and government is working with fisherman to try and eliminate this problem.

Two species of seals are resident in the UK. They were both affected by outbreaks of Phocine Distemper Virus (PDV) and while the grey seal (*Halichoerus grypus*) population has been increasing in the last few years, the trends in common seal (*Phoca vitulina*) populations around the UK have varied, with those in the North Sea having apparently suffered recent decline. A conservation order has been put in place in the Scottish Northern Isles and the east coast of Scotland to provide further protection while the causes for this apparent decline are being investigated.

1.13.5 Marine fish

The status of most fish species in UK marine waters is very poorly known. Of over 330 fish species recorded in the UK's continental shelf waters, only 30 commercially important species are regularly assessed by International Council for the Exploration of the Seas (ICES). The remainder are mostly species of low commercial value and there are generally insufficient data available to assess their status.

Over the past decade there has been a small improvement in status of some commercial fish stocks. Of those stocks assessed by ICES, 38% were considered,

in 2005, to be harvested within safe biological limits (full reproductive capacity and harvested sustainably), compared with 21-27% between 1998 and 2000. However, the status of some species, most notably cod (*Gadus morhua*), continued to decline during this period and 30% of the demersal fish stocks in UK waters that have been assessed by ICES remain outside safe biological limits (suffering, or at risk of, reduced reproductive capacity).

Because of their low reproductive rates, sharks, rays and a number of deep-water fish species (e.g. orange roughy *Hoplostethus atlanticus*) are considered to be at particular risk from fishing. Scarcity of data on most of these species makes it impossible to quantitatively assess their status, however in 2006 the IUCN's Shark Specialist Group carried out semi-quantitative Red-List assessments for 111 chondrichthyan species in the North East Atlantic. The preliminary findings of the workshop were that 32% of assessed species were threatened (Critically Endangered, Endangered or Vulnerable) with a further 24% assessed as Data Deficient.

In addition to the effects of fishing pressure, fish distribution and abundance have changed in response to changes in the ocean climate. A Centre for Environment, Fisheries and Aquaculture Science (CEFAS) study of the distribution of demersal fish in the North Sea over a 25 year period found latitudinal shifts in distribution in response to rising sea temperatures for 15 of the 36 species studied. Distances moved ranged from 48 to 403 km and, in all but two cases, the direction of movement was northwards. For some species, the effects of climate change may compound the effects of fishing. For example, modelling has shown that higher water temperatures can be expected to lead to slower recovery rates for depleted cod stocks. For some other species, higher water temperatures may lead to faster growth and increased productivity. It has also been shown that the abundances of warm water fish species (e.g. red mullet *Mullus surmuletus*, John Dory *Zeus faber*, triggerfish *Balistes capriscus*) have increased in UK waters in recent decades while many cold water species have experienced declines (www.mccip.org.uk/arc).

1.14. Key threats to biodiversity

In the UK Biodiversity Action Plan 2005 report²⁵, lead partners for each species and habitat action plan were asked to list the issues that were currently posing, or likely to pose, a significant threat over the next 5 years. Key threats faced by priority habitats and species were: habitat loss (particularly due to agriculture or changes in management practices), infrastructure development (mainly housing infrastructure and development on the coast), and climate change including adaptation actions taken in other sectors. The reasons for adverse condition of protected areas has been analysed in detail. The top ten reasons are: overgrazing (typically in the uplands), moor-burning, coastal squeeze, drainage, water pollution from agriculture and discharge, air pollution, undergrazing (typically in the lowlands), inappropriate scrub control and lack of appropriate forestry/woodland management (including management of deer grazing).

Action is being taken to address these issues. For example:

²⁵ <http://www.ukbap.org.uk/library/Reporting2005/UKBAPReport05.pdf>

- Ensuring that major infrastructure development does not lead to adverse impacts on biodiversity and enhances it wherever possible using the framework set out in National Policy Statements under the planning reform agenda.
- The UK is working towards achieving targets ensuring that 95% of SSSIs are in 'favourable' or 'recovering' condition. There are slightly different targets and timescales in place for each of the 4 countries within the UK. All sectors are being encouraged to work together to improve protected area condition and identify where biodiversity can help contribute to other aims and objectives.
- Environment departments within the UK devolved administrations are working towards involving and integrating government departments to increase communication on issues such as planning and development, utilising alternative energy resources and sustainable transport. Engaging other government departments in consultations will help devolved administrations to deliver their biodiversity aims. For example, to engage with other government departments, Defra has established a Cross-Whitehall Domestic Adaptation Programme Board, chaired by the Director General of Defra's Environment and Rural Group.
- Enhancing biodiversity in agricultural areas by encouraging more environmentally friendly farming practices, including through agri-environment incentive schemes.
- The UK is working to ensure that the true value of ecosystems and the services provided are taken into account in policy and decision-making (for example by utilising Defra's Guide to Valuing Ecosystem Services).
- The UK is working to embed climate change adaptation for biodiversity into the relevant work-programmes of the Country Biodiversity Strategies (see chapter 2) so that they effectively become the climate change adaptation strategies for UK biodiversity. Promotion of adaptation measures in all relevant sectors is required – including agriculture, forestry, water management and land use planning.
- Due to recent changes in legislation, every UK public body is required to take biodiversity into consideration when exercising their functions. England and Wales are working towards this through implementation of Section 40 of the Natural Environment and Rural Communities Act (2006) which imposes a duty to take biodiversity into account on all public bodies. Scotland is implementing Section 1 of the Nature Conservation (Scotland) Act 2004 and Northern Ireland are acting under the Wildlife (Amendment) (Northern Ireland) Order 1995:

Section 1 of the Nature Conservation (Scotland) Act 2004:

<http://www.opsi.gov.uk/legislation/scotland/acts2004/20040006.htm>

Section 40 of the Natural Environment and Rural Communities Act in England and Wales: <http://www.opsi.gov.uk/ACTS/acts2006/20060016.htm>

Wildlife (Amendment) (Northern Ireland) Order 1995:

http://www.opsi.gov.uk/si/si1995/Uksi_19950761_en_1.htm

- The UK is also working towards capitalising on opportunities such as ensuring water supply companies take account of biodiversity needs when they prepare their five-year forward business plans. The 2004 round generated almost £500m of investment that brought benefits to protected water and wetland sites.
- The UK is working to ensure that the Forestry Commission and Forestry Service develop policies on the restoration of open ground priority habitats from forestry.
- Effective marine legislation needs to be implemented across the whole UK and will be tackled in different ways by the devolved administrations of the four countries based on their individual needs and drivers.

1.14.1 Climate Change

Whilst it is not certain what the impacts climate change will be on UK biodiversity, the UK is likely to face longer, hotter summers, wetter winters and more extreme weather events, and there will be longer growing seasons for plants. These conditions are likely to significantly affect species ranges, preferred habitats and behaviour.

The 2009 biodiversity indicator update (<http://www.jncc.gov.uk/page-4247>) included a spring index based on the timing of first flowering of hawthorn (*Crataegus mongyna*), first flowering of horse chestnut (*Aesculus hippocastanum*), first recorded flight of orange-tip butterfly (*Anthocharis cardamines*) and first sight of a swallow (*Hirundo rustica*). Comparing the 1998 -2008 data with 1900-1947 data showed that on average spring events occurred 7 days earlier from 1998-2007.

Many species are already showing evidence of northward extension in their distribution in the UK. Studies such as the MONARCH project (http://www.ukcip.org.uk/index.php?option=com_content&task=view&id=331&Itemid=9) which modelled the 'climate space' of priority species identified in the UKBAP, using established climate change scenarios, are being used to identify possible outcomes.

It is predicted that climate change will lead to changes in temperature of the seas, pH level (ocean acidification), water circulation and sea level rise. Changes are likely to occur in the abundance and distribution of marine habitats and species. For example, recent warmer conditions appear to have led to changes in the distribution of fish prey species, which in turn have led to reduced breeding success in some seabird populations. Sea-level rise associated with climate change is likely to accelerate the rate of loss of coastal habitats around the UK. For example, it is estimated that an average of 100 ha of saltmarsh is being lost every year in the UK as a result of coastal squeeze. The vast majority of these losses are in the south and east of England where the Government has established a target for the creation of at least 100 ha of intertidal habitat per year through the flood management programme to offset this impact and contribute to meeting biodiversity targets.

Increasing the resilience of species, habitats and ecosystems to climate change will help the widest range of biodiversity to survive its impacts and adapt. UK strategies should seek to:

- conserve the range and ecological variability of habitats and species;

- maintain existing ecological networks;
- create buffer zones around high quality habitats; and
- take prompt action to control the spread of invasive species.

The mainstreaming of climate change action across the country biodiversity strategies mentioned above will also help.

Our biodiversity plays an important role in helping mitigate against climate change with forests and peatlands providing carbon sinks. Adaptation for biodiversity will need to be a long term activity as our knowledge increases and our biodiversity will be vital in our capacity to buffer against negative impacts caused by climate change. It is difficult to predict the likely consequences of mitigation and adaptation measures in other sectors, but the key lies in ensuring that sustainable options are developed, for example in the area of renewable energy.

1.15 Conclusions

1.15.1 Terrestrial / Freshwater Habitat and Species Conclusions

Some conclusions are given within each of the previous sections but it is important to draw out some of the overarching reasons for changes to UK nature. Over the last 30-40 years about 30% of habitats and species have declined - mainly between 1960 and the mid 1980s. These declines were shown to have largely levelled out or reversed in the 1990s with some notable exceptions. The declines between 1960 and the 1980s are largely attributable to habitat loss caused by agricultural intensification practices (including the use of fertilisers and pesticides), increased land drainage, the channelization of water courses and eutrophication of water bodies, the reduction in extent of hedgerows and loss of farm ponds, and the coniferisation of broadleaf woodlands; particularly in eastern and southern Britain.

In the uplands, the principal changes were: increased grazing levels as a consequence of incentive payments (often leading to the loss of heather moorland); major afforestation schemes; and, in some areas, the effects of acidification. While afforestation and acidification have been addressed to some extent since the mid 1980s, grazing remains a problem.

The improvements seen since the mid 1980s were attributed to reduction in lowland habitat loss and measures to improve both water and air quality. A range of conservation-related measures introduced in the 1990s also helped, cumulatively, to stabilise, and in some areas increase, the biodiversity carrying-capacity of lowland Britain and to assist recovery for many of the most threatened habitats and species.

Against this historic backdrop of the last 30-40 years, the current situation is a mixed picture:

- Good progress is being made in improving the management and condition of protected areas;
- Some biodiversity outside protected areas continues to decline, although there has been progress in some areas, in particular, due to improvements in water quality; and,
- There is a general pattern across many taxa, including birds, butterflies and plants for generalist species to be faring better than specialists, indicating a

loss of specialist niches; the countryside is becoming more uniform in structure.

1.15.2 Climate Change Conclusions

Data on bird trends are sufficiently robust to identify major events over the last few years and some of the new analyses of data confirm that as predicted in 2002, climate change is likely to be the single most important driver of changes to the state of UK nature in the future. At present however, habitat transformation is still the factor most implicated in the decline of bird species.

Climate change effects are thought to account for the majority of changes to wintering waterbird populations and are implicated as one of the major drivers of change for vascular plants, mammals, moths and butterflies. Modelling of biological recording data also predicts that climate effects could account for more than 50% of future changes to the distribution of species. The evidence is becoming overwhelming that climate change is a major consideration for nature conservation now and in the future.

In terms of adapting to and living with climate change, attention has been given to ecological connectivity and associated issues such as gene flow and features of the landscape that improve connectivity. This area of work has been further emphasised by the negative effects of habitat fragmentation on biodiversity particularly through online data becoming available for moth species and new reports on butterfly status.

The Biodiversity Research Advisory Group (BRAG) has identified high priority research needs for genetic aspects of conservation which are likely to become much more central to conservation work as we grapple with range changes and adaptation needed for biodiversity to respond to climate change. Getting this research started and applying the results that ensue is a priority activity.

1.15.3 Marine Conclusions

In the marine environment, the main changes appear to have been brought about by the effects of over-fishing which intensified from the 1970s onwards and the warming of the UK's seas, which became apparent in the mid-1980s. The measures which have been taken on fisheries management have not yet led to recovery. The recent 2006 report from Marine Climate Change Impacts Partnership (MCCIP) concluded that *'The variety and distribution of marine species are being altered by climate change, although it is not the only actor. Cold-water species of plankton, fish and intertidal invertebrates are retreating northwards around the UK and the ranges of southern species are expanding. Fishing pressure remains the principal cause of changes in the abundance of most fish species and yield significant damage to seabed habitats, but climate has probably also played a role in some cases.'* Non native species and pollution (including eutrophication) are other important factors of change in the marine environment both exacerbated by climate change effects.

The '2005 State of UK Seas' report concluded:

- the status of commercial fish stocks is unacceptable with many stocks being fished outside safe limits;
- there have been unacceptable negative changes to plankton communities attributable to climate change;

- status and trends for cetaceans are unknown but bycatch figures are still worrying;
- after mixed fortunes seal populations have stabilised.

For cetaceans and seals a little more information is now available. Many of the small cetacean species in UK waters seem to be in favourable conservation status while the status of species occurring mostly in offshore waters is unknown. Bycatch is still the major cause for concern with regards to the conservation status of small cetaceans. Grey seal (*Halichoerus grypus*) populations have been increasing in the last few years while common seals (*Phoca vitulina*) in the North Sea have some evidence of a decline.

Quite clearly, the knowledge about status and trends of marine species and habitats is insufficient to inform marine conservation action and policy adequately. This tends to lead to ambiguous messages. Establishing a simple estimate of the marine wildlife resource from which to start appears to be a logical first step hence the JNCC emphasis on mapping seabed habitats through the Mapping European Seabeds Habitat (MESH) project and other related activities. Seabed maps are a critical first step to monitoring. The development of an integrated UK marine monitoring and assessment strategy (UKMMAS) is also underway and needs to be finalised and implemented as a matter of urgency.

Chapter II – Current status of National Biodiversity Strategies and Action plans

Summary

This chapter summarises the status of implementation of the UK Biodiversity Action Plan – the UK's NBSAP. Following devolution and a number of other top-level drivers, a new strategic framework was published in 2007. Entitled '*Conserving Biodiversity – the UK approach*' it is based upon the twin principles of partnership and the ecosystem approach. Underpinning the UK framework are country strategies for biodiversity and environment in each of the four countries of the UK. These include further priorities and are supported by additional measures and indicators, reflecting the countries' different responsibilities, needs and views.

2.1 Introduction

In 1994 the UK Government launched the UK Biodiversity Action Plan (UK BAP www.ukbap.org.uk), a national strategy which identified broad activities for conservation work over the next 20 years, and established fundamental principles for future biodiversity conservation. Species Action Plans and Habitat Action Plans (SAPs and HAPs) for 391 species and 45 habitats were published in the period between 1995 and 1999. Local Biodiversity Action Plans (LBAPs) were also identified as being important to the implementation of the strategy, and were developed, largely conforming to county boundaries.

Species and habitats were identified for action plans as a result of a number of factors, including decline, rarity and threats. Species and habitat action plans provide a framework for action led through the formation of SMART²⁶ targets. Local Biodiversity Action Plans are a mechanism to enable national targets to be delivered at a local level, and to raise awareness of biodiversity issues by focussing on species and habitats with local relevance / resonance. The biodiversity action recording system (<http://www.ukbap-reporting.org.uk/>) uses the targets to facilitate guidance to action and reporting at both smaller and larger geographic scales.

Following devolution and a number of other top-level drivers, such as the 2010 targets, the findings of the Millennium Ecosystem Assessment and the greater need to address the effects of climate change, a new strategic framework was published in 2007. Entitled '*Conserving Biodiversity – the UK approach*' (see <http://www.defra.gov.uk/wildlife-countryside/pdf/biodiversity/conbiouk-102007.pdf>) it is based upon the twin principles of partnership and the ecosystem approach. It sets out a vision and shared purpose in tackling the loss and restoration of biodiversity, the guiding principles that are to be followed to achieve it, the priorities for action in the UK and internationally, and indicators to monitor the key issues on a UK basis.

²⁶ Specific, Measureable, Achievable, Realistic and Time-bound.

2.2 UK Country Strategies

Underpinning the UK framework are country strategies for biodiversity and the environment in each of the four countries of the UK. These include further priorities and are supported by additional measures and indicators, reflecting the countries' different responsibilities, needs and views. Objectives of the strategies are generally to:

- Halt the loss of biodiversity and continue to reverse previous losses through targeted actions for species and habitats.
- Increase awareness, understanding and enjoyment of biodiversity, and engage more people in conservation and enhancement.
- Restore and enhance biodiversity in urban, rural and marine environments through better planning, design and practice.
- Develop an effective management framework that ensures biodiversity is taken into account in wider decision making.
- Ensure knowledge on biodiversity is available to all policy makers and practitioners.

The four country strategies are:

2.2.1 England:

Working with the grain of nature: A biodiversity strategy for England, Defra, 2002

<http://www.defra.gov.uk/wildlife-countryside/pdf/biodiversity/biostrategy.pdf>

2.2.2 Scotland:

Scotland's Biodiversity, It's In Your Hands; A Strategy for the Conservation and Enhancement of Biodiversity in Scotland, Scottish Executive, 2004

<http://www.scotland.gov.uk/Resource/Doc/25954/0014583.pdf>.

2.2.3 Wales:

Environment Strategy for Wales, Welsh Assembly Government, 2006

<http://wales.gov.uk/topics/environmentcountryside/epq/envstratforwales/;jsessionid=vN4dJ6BLw6whgdhWdGmYnx2vZpbmNgyKT7y1nvhy1zMljfGxrGk!2101391267?lang=en>

2.2.4 Northern Ireland:

Northern Ireland Biodiversity Strategy, Northern Ireland Biodiversity Group, 2002

<http://www.ehsni.gov.uk/nibs2002.pdf>.

2.3 UK Biodiversity Action Plan (UK BAP)

2.3.1 UK BAP Reviews

Two reviews of the UK BAP have taken place. A targets review (<http://www.ukbap.org.uk/bapgroupage.aspx?id=98>), which took place between

2004 and 2006, updated targets within the existing HAPs and SAPs. A review of the priority habitats and species took place between 2005 and 2007. It resulted in a revised UK list of priority species and habitats (<http://www.ukbap.org.uk/NewPriorityList.aspx>). The list contains 1,150 species and 65 habitats. The four countries of the UK will take steps to secure conservation gains for these priorities.

The revised UK list of priority habitats and species is an important reference source. It has been used to inform statutory lists of priorities (see below) in England, Scotland and Wales and will be used for an equivalent list in Northern Ireland. It was also published with an initial assessment of the most important types of action necessary for the conservation of each species. The four countries are working together to translate these actions into programmes of work delivered by partnerships of statutory, voluntary, academic, and business organisations - at the level most appropriate to the needs of biodiversity.

2.3.2 England

The Natural Environment and Rural Communities Act (2006, <http://www.opsi.gov.uk/ACTS/acts2006/20060016.htm>), Section 41, states that the Secretary of State must publish a list of the living organisms and types of habitat which in the Secretary of State's opinion are of principal importance for the purpose of conserving biodiversity. Before publishing such a list, the Secretary of State must consult Natural England (the statutory conservation adviser) as to the living organisms or types of habitat to be included. Further, the Secretary of State must take steps, and promote the taking of steps by others, to further the conservation of the habitats and species on the list. England published its list of 56 habitats and 943 species in 2008. This included the English species and habitats in the UK BAP list and one additional species of specific concern for England, the hen harrier (*Circus cyaneus*).

2.3.3 Wales

Section 42 of the NERC Act 2006, (<http://www.opsi.gov.uk/ACTS/acts2006/20060016.htm>) applies in a similar fashion to Wales. The Wales Biodiversity Partnership and CCW advised the Welsh Assembly Government on habitat and species priorities, which were approved by the Minister and published in January 2008. The list and guidance, in the form of checklists are available on the Wales Biodiversity Partnership website at http://www.biodiversitywales.org.uk/legislation_guidance-20.aspx.

2.3.4 Scotland

Within Scotland the Scottish Biodiversity List was published in December 2005 www.biodiversityscotland.gov.uk/pageType2.php?id=35&type=2&navID=92. This was a requirement under section 2(4) of the Nature Conservation (Scotland) Act 2004, which obliges the Scottish Ministers to publish a list of species of flora, fauna and habitats of principal importance for the purpose of implementing the Biodiversity Duty within a year of the publication of the Scottish Biodiversity Strategy.

In Scotland there are 610 species and 60 habitats identified as priorities for conservation action within the revised UK list of priority species and habitats.

Responsibility for promoting the conservation of these species and habitats is divided amongst 5 priority ecosystem expert groups (see section 3.2.2 for further detail).

2.3.5 Northern Ireland

Northern Ireland will also be looking to produce a list of country priorities in line with the Wildlife (Amendment) (Northern Ireland) Order, 1995.

(http://www.opsi.gov.uk/si/si1995/Uksi_19950761_en_1.htm).

2.3.6 UK BAP Success

The UK BAP has raised awareness of threats and helped co-ordinate and drive new conservation work at national and local levels. This has been achieved by identifying priorities for action and setting biological targets for the recovery of species and habitats, including those not subject to statutory protection. It has also been influential in attracting other sources of funding such as grants from the national lottery and schemes associated with the tax levied on burying waste.

The review of priority species and habitats resulted in 123 species no longer meeting the criteria for selection on the revised list. In some, but not all, cases this was a result of conservation action. Species such as the Devil's bolete (*Boletus satanas*) and the Killarney fern (*Trichomanes speciosum*) were removed from this list because of successful conservation effort.

The UK BAP has also engendered a strong partnership between the UK Government, Devolved Administrations, statutory agencies, local authorities and non-Governmental organisations, and this partnership has enabled much more progress than would have been possible otherwise.

The success of the UK BAP in the marine environment has been more limited, but the marine ecosystem indicator is showing some signs of fish stock recovery and the Marine and Coastal Access Bill (see Chapter 3.3.3), will, subject to the wishes of Parliament, provide the mechanism to address the challenges of protecting nationally important marine species and habitats in England, Wales and UK offshore waters; with Scotland and Northern Ireland considering similar legislation in their own waters. However, there are particular issues involved in taking effective action for some mobile priority species (e.g. sharks, skates, rays and deep water species), including achieving effective fisheries control measures beyond 6 nautical miles, where agreement is generally required at EU level. The development of the forthcoming EU Shark Plan of Action may provide a good opportunity for progress.

Chapter III - Sectoral and cross-sectoral integration or mainstreaming of biodiversity considerations

Summary

Implementing the country biodiversity strategies is a cross-government responsibility, with leadership from all departments to their stakeholders. To halt biodiversity loss, the strategies seek to make biodiversity part of the mainstream of policies and incorporate the relevant UK BAP targets at the country level. Many actions are being taken at a variety of levels, and often in a cross-cutting manner. The basis for much of this is a statutory requirement on public bodies to take account of biodiversity conservation when undertaking their functions. This chapter also provides information on how the UK is bringing biodiversity considerations into decision making, by all sectors, thereby making mainstreaming a reality. The report does not try to be comprehensive, rather the text should be regarded as illustrative of the sorts of approach that are being taken across the UK; local solutions are being found to local problems within the context of broader policies being used as necessary. In some cases a sectoral approach is being used, in others a cross-cutting approach.

3.1 Introduction

As mentioned in chapter 2, the UK government and the devolved administrations have adopted a shared vision for biodiversity conservation, as stated in 'Conserving Biodiversity – the UK Approach', Defra, 2007 (<http://www.defra.gov.uk/wildlife-countryside/pdfs/biodiversity/ConBioUK-Oct2007.pdf>):

“Our vision is that in our countryside, towns and seas, living things and their habitats are part of healthy, functioning ecosystems; we value our natural environment, a concern for biodiversity is embedded in policies and decisions, and more people enjoy, understand and act to improve the natural world around them.”

Achievement of this vision requires a holistic approach to conservation which recognises interdependencies and uses a variety of current and emerging schemes and policy instruments. Work to embed consideration of biodiversity and ecosystem services is being taken forward through the biodiversity and environment strategies of each of the four countries of the UK (see chapter 2) and through the statutory conservation bodies as the main delivery agents.

3.2 UK Country Integration Strategies

Implementing the strategies is a cross-government responsibility, with leadership from all departments to their stakeholders. To halt biodiversity loss, the strategies seek to make biodiversity part of the mainstream of policies and incorporate the relevant UK BAP targets at the country level. Many actions are being taken at a variety of levels, and often in a cross-cutting manner. The basis for much of this is a statutory requirement on public bodies to take account of biodiversity conservation when undertaking their functions. The strategies emphasise that healthy, thriving and diverse ecosystems are essential to everybody's quality of life and well-being.

The information below is a summary of the current situation in each country – much more is being done than there is space available to report. Examples of mainstreaming are provided in section 3.3.

3.2.1 England

The biodiversity strategy for England is divided into a number of workstreams to address sectoral and cross-sectoral issues: agriculture; woodlands and forestry; water and wetlands; towns, cities and development; coasts; marine; climate change adaptation; local and regional; economics and funding; business and biodiversity; education and public understanding (<http://www.defra.gov.uk/wildlife-countryside/pdf/biodiversity/biostrategy.pdf>).

In addition, guidance has been issued to local authorities and other public bodies on how to implement the statutory duty to take account of biodiversity when undertaking their functions. It is available from <http://www.defra.gov.uk/wildlife-countryside/biodiversity/key-docs.htm#la>.

At the local government level, a new biodiversity indicator was adopted in 2008 as part of a new streamlined performance framework for local authorities in England. The backbone of the new framework is a set of 198 national indicators. The national indicator set reflects the key priorities agreed between central and local government on which improved outcomes are expected to be delivered.

To reflect the importance which is attached to conservation of biodiversity, a biodiversity indicator (“NI 197”) has been included in this tightly focused national indicator set. This will measure the proportion of Local Sites in positive management in each local authority area. Local Sites are sites of substantive nature conservation value. There are over 37,000 such sites in England and they play an important role in conservation outside statutorily protected sites. In measuring the proportion of Local Sites which are in positive management, the indicator relates to the influence that local authorities have on Local Sites management systems, including through working effectively in partnership. This was chosen as the best proxy for overall local authority performance on biodiversity conservation. More information can be found at: <http://www.defra.gov.uk/environment/localgovindicators/ni197.htm>.

Local authorities in England will begin to report their performance against this set of indicators from April 2009 and outcomes will be published annually through the new system of Comprehensive Area Assessment.

3.2.2 Scotland

Scotland's Biodiversity Strategy was published in 2004 www.scotland.gov.uk/Resource/Doc/25954/0014583.pdf. Scotland is committed to an ecosystem based approach to delivering and mainstreaming biodiversity conservation and has recently restructured the delivery mechanisms to achieve this. Five ecosystem groups covering upland; woodland; marine and coastal; freshwater and wetland; and lowland and farming have been established. These groups include experts from government bodies as well as NGOs.

The Nature Conservation (Scotland) Act 2004 revised nature conservation legislation in Scotland with the overall aim of protecting wildlife. For the first time in Scotland,

the Act placed on public bodies a duty to further the conservation of biodiversity, as well as modernising the system for protecting Scotland's most precious areas for biodiversity (Sites of Special Scientific Interest) and strengthening the laws against wildlife crime. Guidance on the implementation of the duty is available at www.biodiversityscotland.gov.uk/pageType2.php?id=19&type=2&navID=59.

The Scottish Government and the Convention of Scottish Local Authorities have agreed on a package of measures to deliver for the people of Scotland, including the development of 15 National Outcomes. One of these outcomes is that “*we value and enjoy our built and natural environment and protect it and enhance it for future generations.*” This must be addressed in each local authority’s Single Outcome Agreement which sets out how they plan to meet the full range of outcomes.

The Scotland Rural Development Programme is a £1.6 billion programme (over 2007-2013) of economic, environmental and social measures designed to develop rural Scotland over the next six years. Individuals and groups may seek support to help deliver the Government's strategic objectives in rural Scotland. Packages within the programme include measures to further the protection and enhancement of biodiversity and landscapes. Some of these measures can be over a wide scale.

Planning for biodiversity delivery in Scotland is now being conducted within the framework of an ecosystem approach. Five Ecosystem Groups, reflecting the principal broad ecosystems found in Scotland, are preparing delivery plans that aim to reduce the pressures on ecosystem functions and processes, as well as habitats and species. These plans will take account of the services these ecosystems provide to people as well as how the ecosystems work. Two further groups provide advice and direction on science and people and communications issues, and the LBAP network is represented on all the groups. The Action Coordination Group oversees delivery across the structure and reports to the strategic Scottish Biodiversity Committee chaired by the Scottish Environment Minister.

The Species Action Framework sets out a strategic approach to species management in Scotland. The Framework identifies 32 species as a high priority for funding over a five year period, focusing on those where we expect significant gains to overall biodiversity. As well as species requiring conservation action, the list includes non-native species which are having a negative impact on biodiversity, and the reintroduction of European beaver (*Castor fiber*); a species which has been extinct in Scotland for about 400 years. A Habitat Action Framework is being developed.

3.2.3 Wales

The Wales Environment Strategy is supported by an Action Plan, linked to the Wales Biodiversity Framework http://www.biodiversitywales.org.uk/about_the_wbp-17.aspx

The second Wales Environment Strategy Action Plan 2008-11 sets out 41 actions in 10 categories – including biodiversity – which recognize the long term nature of environmental action and change. The Plan is supported by indicators and progress reports, against outcomes.

<http://wales.gov.uk/topics/environmentcountryside/epq/envstratforwales/?lang=en>

The Wales Biodiversity Partnership (WBP) steers and co-ordinates the implementation of the UK BAP in Wales. They provide guidance and support the 24 Local Biodiversity Action Plan Partnerships as well as monitoring and reporting on progress, using the Biodiversity Action Reporting System. The Partnership has initiated a number of measures aimed at encouraging and enabling public sector bodies to take action to improve biodiversity and helps access funding.

To fully implement the Natural Environment and Rural Communities Act (2006) Biodiversity Duty, Habitats Regulations and other biodiversity related legislation, WBP have produced biodiversity checklists for local and public authority staff on how to take account of biodiversity in their operational activities. A series of high-profile workshops were hosted by the Welsh Assembly Government Minister for the Environment, Sustainability & Housing at Local Records Centres in 2008. The aim was to increase integration of biodiversity into policy and decision making. The workshops were followed by a WBP visit to 'biodiversity champions' in each local authority and National Park to conduct a baseline assessment and agree a series of actions designed to ensure compliance and raise the profile of biodiversity.

3.2.4 Northern Ireland

The Northern Ireland biodiversity strategy <http://www.ehsni.gov.uk/nibs2002.pdf> is based on the publication "Recommendations to Government for a Biodiversity Strategy", which includes 76 recommendations divided into groupings: implementation / delivery groups on peatlands; uplands; agricultural systems/farmland birds; freshwater and wetlands; coasts and marine.

Progress on the NI strategy is monitored by the NI Biodiversity Group which has recommended that Biodiversity Implementation Plans (BIPs) be developed by each Government Department. These BIPs record practical policy and operational actions which encourage biodiversity.

The Department of the Environment (DOE) is also introducing legislation to review the Wildlife Order (NI) 1985 including introducing a statutory biodiversity duty for all public bodies. It is hoped to have this legislation in place by the summer of 2010 together with related guidance material.

3.3 Addressing threats to biodiversity

The following text provides some examples of how the UK is bringing biodiversity considerations into decision making, by all sectors, thereby making mainstreaming a reality. The report does not try to be comprehensive, rather the text below should be regarded as illustrative of the sorts of approach that are being taken across the UK; local solutions are being found to local problems within the context of broader policies being used as necessary. In some cases a sectoral approach is being used, in others a cross-cutting approach.

3.3.1 Agriculture

The reform of the Common Agricultural Policy (CAP), agreed in June 2003, was a major breakthrough as it reduced the environmental impact of agriculture by removing an incentive to intensify production. The new CAP also required farmers

to comply with the environmental standards under the cross compliance regulations in order to receive the subsidy payment (the Single Farm Payment).

There are three aspects to cross compliance:

- Specific European legal requirements, known as Statutory Management Requirements (SMRs);
- Domestic legal requirements requiring the land to be kept in Good Agricultural and Environmental Condition (GAEC) which must be set out according to the framework drawn up by the Commission;
- Requirements to maintain a level of permanent pasture not included in the crop rotation for 5 years or more.

The UK has fully implemented cross-compliance and made effective use of the Commission's framework for Good Agricultural and Environmental Condition. This includes standards to prevent overgrazing and damaging supplementary feeding practices on semi-natural areas, control of injurious and invasive weeds, protection of hedgerows and watercourses including through protection zones (buffer strips), standards to improve the management of soils and reduce the risk of loss of sediment and pollutants to watercourses, and support for a breadth of existing environmental legislation such as the Environmental Impact Assessment Regulations. Equally important has been supporting farmers to change their farming methods to conserve biodiversity through agri-environment schemes.

The revision of the Rural Development Plan has led to greater targeting of Welsh Agri-environment and land management schemes to deliver environmental priorities, in particular, climate change and enhancing biodiversity. The new agri-environment scheme is presently out at consultation with a view to implementing the new schemes by 2012. In the meantime, interim improvements have been put in place within existing schemes such as Special Sites targeting and Species Packages.

In England, where 70% of the land area is farmed, the Environmental Stewardship Scheme is a key lever to help embed biodiversity considerations. It was launched in 2005 and provides funding and advice to farmers and other land managers in England to deliver effective environmental management of their land, including a reverse of losses in farmland features of value to wildlife. By the end of 2008, over five million hectares of farmland were in the scheme, with just under one million hectares still in the closed schemes (Countryside Stewardship and Environmentally Sensitive Areas). Information about the scheme and associated guidance can be found at <http://www.naturalengland.org.uk/ourwork/farming/funding/es/default.aspx>.

In October 2007, following a review, Defra introduced revised heather and grass burning regulations together with a revised voluntary Code aimed at maximising the benefits of responsible burning and reducing risks. Moorland owners and gamekeepers have strongly supported the new Code. Consequently, the area of moorland in England affected by inappropriate burning has dropped from 101,000 ha in 2006 to 30,000 ha in May 2008. A Heather and Grass Burning Code was launched in Wales in May 2008 which requires landowners to prepare a burning plan for their hill land. Burning without a plan or outside the times in the plan is treated as a breach of Cross Compliance measures.

One of the most frequent problems encountered on pasture land which is managed both for agricultural and conservation purposes is getting the amount, timing and

type of grazing to match the conservation outcomes desired. Regulatory response to overgrazing has targeted both the owners of damaged SSSIs, and those in receipt of livestock subsidy payments through cross-compliance requirements to avoid overgrazing of semi-natural habitats. Incentive payments to reduce stocking levels and to restore upland vegetation, particularly on moorland, have been part of agri-environment schemes since the late 1980s. In England the use of tightly focused agri-environment scheme agreements on SSSIs, backed up by regulation, has reduced the area of land affected by overgrazing from 205,700 ha of SSSI land, to 64,300 ha.

It's not just overgrazing that's a problem though. In some areas, undergrazing is the major issue. Driven by both the condition of many SSSIs and UK BAP targets, the re-introduction of grazing is being encouraged on previously undergrazed sites, particularly through agri-environment schemes. Several projects, such as the Grazing Animals Project, are also encouraging the use of traditional breeds, helping to achieve not only the right kind of grazing, but also helping to boost the declining numbers of native breeds of cattle and sheep.

Red deer is a keystone species in upland and woodland ecosystems in Scotland and grazing by deer and livestock plays an important role in maintaining many important habitats. However, too much, or too little, grazing can present problems. Currently 312 features on designated sites are assessed as being at risk from grazing and trampling impacts. A programme of action to address these impacts through a combination of monitoring advice, incentives and regulation is underway across a suite of sites to address 211 of these features.

3.3.2 Woodlands

Ancient woodlands (continuously wooded since before 1600) are one of the most diverse habitats in the UK in terms of species richness. Around half of England's woodland (circa 500,000 ha) is either native or ancient. Government policy (see <http://www.forestry.gov.uk/Keepersoftime>) on protecting and sustainably managing this habitat was published in 2005. It aims to prevent further loss; improve ecological condition; conserve rare and priority species, and increase opportunities for enterprise and employment. Forestry Commission England and Natural England are helping to deliver this policy by employing a "whole-woodland" approach to tackle the threats faced by this woodland and managing it in a manner that is sensitive to nature. Funding is available from the Forestry Commission England under the England Woodland Grants scheme to improve woodland condition. The Commission are also consulting on their draft new practice guide for woodland managers '*Managing ancient and native woodland*'.

One of the big negative pressures on woodlands is grazing as a result of high deer populations. The Deer Initiative <http://www.thedeerinitiative.co.uk/>, facilitates research on deer population sizes and investigates how reducing deer numbers affects woodland condition. Condition data is obtained via a sample of SSSIs that are monitored in various target regions.

Scotland's forests are home to some of its most special wildlife and plants. The Forestry Commission's Scottish Forestry Strategy gives priority to managing woodland for the benefit of biodiversity and the Commission is closely involved in a range of projects to achieve that. In particular, the Commission is a partner in

projects to increase the number of capercaillie (*Tetrao urogallus*) and black grouse (*Lyrurus tetrix*) living and breeding in its forests. One such project, in which FCS worked with Scottish Natural Heritage, Royal Society for the Protection of Birds, Highland Birchwoods, Forest Research, the Scottish Government, the Cairngorms National Park Authority, and more than 30 private forest owners under a five-year European LIFE funded project, resulted in capercaillie having their most successful breeding season for 14 years in the summer of 2006.

Woodland ecosystems constitute a significant proportion of Scotland's biodiversity. Over time many woods have become fragmented as land has been cleared for agriculture or lost to development. As woodlands become isolated, the ecosystems they support are less resilient, and less able to recover from disturbance and external threats. This is because the less mobile woodland specialist plants and animals cannot move between isolated woodland patches. Forest Research, working with the Local Authorities of Edinburgh and the Lothians, Scottish Natural Heritage and Forestry Commission Scotland have used landscape ecology modelling techniques to produce a forest habitat network for the region. The resulting maps will be used by planners and developers to identify priority areas for managing woodlands, and areas to target for new planting. In particular, the work has identified opportunities for woodland to be incorporated within areas designated for development so that existing habitat can be linked. In the future these woodlands will provide habitat for biodiversity, reduce stress, pollution, and noise for urban communities, and offer opportunities for education, relaxation and recreation.

3.3.3 Marine and Coastal

A Marine and Coastal Access Bill is currently being debated in Parliament. This contains an integrated set of complementary proposals for a new approach to the management of activities in English, Welsh and UK offshore waters. Part 5 of the Bill provides for the designation and effective protection of a new type of marine protected area, to be called Marine Conservation Zones (MCZs). These can be used to conserve habitats and species of national importance, and will help to create an ecologically coherent network of sites around the UK. MCZs will have clear conservation objectives and will be protected through a series of duties placed on public authorities. Other provisions in the Bill, dealing with marine planning, licensing, the creation of a new Marine Management Organisation and Inshore Fisheries and Conservation Authorities, and improved enforcement powers, will also help to improve the management and conservation of marine biodiversity. Defra is establishing, with the Environment Agency, targets to recreate habitats lost due to coastal squeeze through flood and coastal erosion risk management.

Scotland's marine area is of great environmental, social and economic value both nationally and internationally. The Scottish Government is committed to ensuring that Scotland's marine and coastal environment is '*clean, healthy, safe, productive and biologically diverse*' and managed to meet the long-term needs of nature and people. This includes managing seas sustainably to protect their rich biological diversity but also to ensure they continue to provide economic, social and other benefits for people and communities. The Scottish Government is committed to the sustainable use and protection of this important marine resource, and the Scottish Marine Bill consultation in 2008 offered a historic opportunity for people and organisations with

an interest in marine issues to come together to help shape the future management of Scotland's marine environment.

In Northern Ireland, the Department of Environment is taking forward a Marine Bill and hopes to consult on policy proposals towards the end of 2009. As in England and Wales, the Bill will include provisions for the designation and effective protection of Marine Conservation Zones.

3.3.4 Water and Wetlands

Many waters within Natura 2000 sites, Ramsar sites and SSSIs are Water Framework Directive (WFD) 'water bodies'. These include rivers, lakes, canals, transitional and coastal waters. Environmental objectives will be set for 'water bodies' to achieve the aim of good status. WFD requires action to be taken on, for example, diffuse pollution from agriculture and on invasive species, so there will be wider biodiversity dividends for river catchments.

The Environment Agency (EA) and the Scottish Environment Protection Agency (SEPA) are developing River Basin Management Plans for each River Basin District. The plans will contain measures for meeting the objectives of 'water bodies' and 'protected areas'. Although the Water Framework Directive does not require measures to be operational until 2012, the UK is already taking action to improve biodiversity in designated conservation sites.

The Water Environment and Water Services (Scotland) Act 2003 (implementing the EU Water Framework Directive) introduced a new approach to protecting the quality of fresh water across whole "river basins" or catchment areas. The Scottish Environment Protection Agency (SEPA) is taking the lead in implementing this new approach in Scotland, working closely with many stakeholders whose activities directly affect rivers and lochs to identify and manage risks to the water environment. SEPA's monitoring of fresh water includes ecological parameters to ensure protection for the natural environment alongside rivers, burns and lochs. They also consider which key invasive species to include in their monitoring systems. SEPA published Significant Water Management Issues Reports in October 2007 for two of Scotland's River Basin Districts, the Solway and Tweed, which highlight a range of significant pressures on fresh water in these areas. Much of the action to manage these will benefit biodiversity.

Since 1994 Government has identified 132 water bodies in England e.g. rivers, as Sensitive Areas. In these areas the Environment Agency found that discharges from sewage treatment works were having or were likely to have an adverse effect on the ecosystem and water quality. Water companies are providing more stringent treatment at relevant sewage treatment works to improve and protect the environment of these areas.

Since April 2006 the England Catchment Sensitive Farming Delivery Initiative has been encouraging farmers to take voluntary action to tackle diffuse water pollution. It has an extensive programme of advice delivered by officers and specialist contractors, through individual farm visits and farmer workshops and also provides some capital grants.

A new vision for wetland creation in England for the next 50 years was published in 2008. It includes a map showing where wetlands could be created, or existing ones

restored, and supporting literature on the importance of wetlands and their benefits to wider society. More information can be found at <http://www.wetlandvision.org.uk/>.

Water and sewerage companies are also taking forward commitments on biodiversity conservation. In the five year period ending in 2009, almost £500m of investment has brought benefits to over 170 water and wetland protected sites damaged by sewage pollution and over-utilisation of water. Water and sewerage companies are drawing up their business plans for the next five-year period. They have received advice on statutory obligations associated with biodiversity conservation.

3.3.5 Air quality

UK Government and devolved administrations are taking a range of actions to address the effects of poor air quality on human health and ecosystems. Due to trans-boundary nature of many of the pollutants involved, action at the international level is vital. Principal legislative drivers are the EU National Emission Ceilings Directive (NECD) and the UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP) Gothenburg Protocol. Both set annual emission ceilings for 2010 for four pollutants: sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia. The UK is expected to meet its targets for all pollutants except nitrogen oxides; leading to significant improvements in acidification, eutrophication and ground-level ozone.

The European Commission has started the preparatory work for a legislative proposal to revise the NECD. The new proposal will likely include a set of tighter emission ceilings to be met by 2020 for the four pollutants already regulated and a new ceiling for the primary emissions of fine particulate matter (PM_{2.5}). The Gothenburg Protocol is currently being reviewed and discussions on revisions have commenced. The proposal is due for agreement in 2009.

On a national scale, the Air Quality Strategy <http://www.defra.gov.uk/environment/airquality/strategy/index.htm> for England, Wales and Northern Ireland, published in 2007, set out a number of objectives and target values for the protection of vegetation and ecosystems.

3.3.6 Invasive Non-Native Species

The GB invasive non-native species framework strategy was launched in May 2008. The UK was amongst the first in Europe to have a comprehensive strategy on this very significant biodiversity threat. Invasive non-native species like Japanese knotweed (*Fallopia japonica*) and grey squirrels (*Sciurus carolinensis*) can impact on native species and habitats in a number of ways: by preying on native wildlife, competing for food and territory, transmitting disease, and degrading habitat.

This strategy is based on internationally agreed advice and principles, and has received widespread support from stakeholders. Its core premise is that agreed under the Convention on Biological Diversity: of firstly seeking to prevent introductions; then swift action against those that are found early; and, finally, effective longer-term management of those that are already established. However, as acknowledged in the strategy, no system will be completely watertight because there is so much scope for invasive species to be introduced deliberately or accidentally through global trade and travel.

Work is in hand to make further use of existing regulatory powers to control what may be released or sold and voluntary advice has also been developed, for example the Horticultural Code of Practice on Helping to Prevent the Spread of Invasive Non-Native Species (2005) (<http://www.defra.gov.uk/wildlife-countryside/pdf/wildlife-manage/non-native/non-nativecop.pdf>), but the scope for additional regulation needs to be balanced against the burdens it would impose. Success will also depend on other approaches such as changing behaviours, and improving understanding of the risks and the need for action against such species. A GB Non-native Species Risk Analysis Panel is now fully functional and issues concerning implementing the rapid response concept and media and communications are being examined through working groups. Work has also begun in developing a national non-native species database.

The plant health regime is a good example of an existing robust line of defence against the introduction of invasive non-native plant pests and the strategy will lay the foundation for better protection of UK native wildlife in general. An aim of the strategy is to back up preventative measures with arrangements to instigate appropriate control actions much sooner in future. This could involve a range of bodies whose interests or responsibilities are relevant and may therefore be resourced in a number of ways. However, early action is more likely to succeed, will cost significantly less and will minimise any potential harm to native wildlife and habitats.

The strategy therefore provides a high level framework for all activities concerning invasive non-native species. It addresses the more *ad hoc* approach of the past which was identified by the GB Policy Review Group as a significant weakness to be overcome. The examples below show how a more strategic approach to preventing the spread of invasive non-native species (as promoted by the Strategy) is being implemented.

The Tweed Invasives Project is a programme to control invasive, non-native plants throughout the 3,000 square miles of the River Tweed Catchment, primarily focusing on giant hogweed (*Heracleum mantegazzianum*) and Japanese knotweed. The project is coordinated by the Tweed Forum in partnership with public bodies, local farmers, landowners, fishing and community groups. The project acts as a point of contact for the public to report sightings of the plants, and also offers advice, training and practical support for controlling them. Over the past five years it has made huge progress, and landscapes in the lower reaches of the Tweed catchment which used to be dominated by invasive plants have been restored to a more natural ecosystem with native plants and trees. The project is considered to be a blueprint for sustainable, long-term control of invasive species and a model of effective partnership working.

The first phase of the Hebridean Mink Project was successful in controlling mink in the Uists and a second phase costing £2.5 million over five years has expanded the project into Lewis and Harris. The aim is to prevent mink (*Neovison vison*) from becoming re-established in the Uists, where they are responsible for preying internationally important populations of breeding birds. European hedgehogs (*Erinaceus europaeus*), introduced to the Uists in 1974, are another significant predator of ground nesting birds. In 2007 the objectives of the Uist Wader Project were expanded to include removing all hedgehogs from North Uist and Benbecula

and to significantly reduce the population of hedgehogs in South Uist with a view to complete removal.

Over the next three years £1.3 million will be spent on the Saving Scotland's Red Squirrels project. The project will develop habitats for red squirrels (*Sciurus vulgaris*) and establish a line of control to prevent the population of introduced grey squirrels spreading north into the red squirrel's stronghold in the Highlands.

Wales has an Invasive Non-Native Species (INNS) working group comprised of all the major agencies which began in 2008 to facilitate the implementation of the INNS Framework Strategy for Great Britain. A site survey, to plan for the eradication of the African clawed toad (*Xenopus laevis*) from the only site in Wales, is scheduled for May 2009. Topmouth gudgeon (*Pseudorasbora parva*) sites will also be surveyed at that time, with actions to be decided upon receipt of the results.

Following on from the Invasive Species in Ireland Report the Northern Ireland Environment Agency (NIEA), in partnership with the National Parks and Wildlife Service, Dublin (NPWS), jointly initiated the 'Invasive Species in Ireland Project' in 2006 to address the issues on an island of Ireland context. Work is in hand to make further use of regulatory powers to control what may be released or sold in Northern Ireland. The review of The Wildlife Order (NI) 1985 in 2008 proposed many significant changes specifically relating to non-native species. The review proposed to give the department the power to ban the sale of high risk species. The project provides a high level of framework for all activities concerning non-native species and provides a focal point for activities, expertise and information.

3.3.7 Infrastructure development

In 2005 Government published Planning Policy Statement (PPS) 9: Biodiversity and Geological Conservation and a linked legal Circular (Office of the Deputy Prime Minister Circular 06/2005/Defra Circular 01/2005). This makes clear that planning policies in England should aim to maintain and enhance, restore or add to biodiversity interests. A good practice guide to support the policy statement was issued in 2006; which includes practical examples of how local authorities can plan positively for biodiversity. A copy of the policy statement and associated guidance is available from <http://www.communities.gov.uk/publications/planningandbuilding/pps9>; and <http://www.communities.gov.uk/publications/planningandbuilding/planningbiodiversity>.

Defra continues to feed biodiversity and other considerations into the development of National Policy Statements (NPS) that Government departments are preparing on the need for major infrastructure developments in relevant sectors e.g. transport, energy, water and waste. These will be the primary consideration for the new Infrastructure Planning Commission in considering applications for new projects and will therefore be very significant documents which will determine the pattern of infrastructure development in England over the next 15 years or so.

Consultations are underway for flagship "eco-towns" across the country. They are expected to be examples of sustainable design that will encourage and enable residents to live within environmental limits. Amongst other things, they should have strategies for conserving local biodiversity. This should include proposals for the

management of local ecosystems, including, where appropriate, the restoration of degraded habitats or the creation of replacement habitats.

Standardised guidance on the development of local wildlife site systems has been completed and placed on the Wales Biodiversity Partnership website <http://www.biodiversitywales.org.uk/content/uploads/documents/Guidance%20Legislation/WS%20Guidance%20FinalWeb%20ver%20Oct%2008Web.pdf>. The guidelines are applied to a site to evaluate its value by assessing rarity, size, naturalness/typicalness and diversity with secondary considerations including; position in ecological unit, potential value, fragility and educational/social value. Planning authorities, utilities, statutory agencies and other relevant bodies can then be informed of location and interest of the site and act accordingly.

Scotland's planning system is undergoing the most significant modernisation in over 60 years. The Planning etc. (Scotland) Act 2006 is a landmark piece of legislation. The changes introduced by the Act are substantial and work is underway to implement the provisions of the Planning Act. The Scottish Government's overall aim is to create a more efficient process to enable sustainable economic growth for Scotland. As part of the commitment to proportionate and practical planning policies, the Scottish Government is rationalising national planning policy by replacing the current series of Scottish Planning Policy notes and the National Planning Policy Guidance series with a single statement of Scottish Planning Policy. The consolidated Scottish Planning Policy will provide a shorter, clearer and more focused statement of national planning policy, including on biodiversity, replacing the existing National Planning Policy Guidance publication on Natural Heritage.

3.3.8 Climate Change

Parliament passed a Climate Change Act in 2008 (http://www.opsi.gov.uk/acts/acts2008/ukpga_20080027_en_1), making the UK the first country in the world to have a legally binding long term framework to cut CO₂ emissions and adapt to climate change. A similar Bill is currently in the midst of the legislative process in Scotland. The Act creates a new approach to managing and responding to climate change in the UK through setting ambitious targets, taking powers to help achieve them, strengthening the institutional framework, and establishing clear and regular accountability to the UK Parliament and devolved legislatures. The statutory UK risk assessment will help set priorities for adaptation programmes, and to make sure that other policies reflect the potential risks and opportunities posed by climate change. An Adaptation Policy Framework draws together information about what the Government is already doing, and why, and setting out how the UK will move forward. Defra has also published practical guidance on climate change adaptation. In October 2008 the UK government created a Department of Energy and Climate Change with a seat in the cabinet, giving greater political focus to solving the challenges of climate change and energy supply.

The England Biodiversity Strategy seeks to ensure biodiversity considerations become embedded in all main sectors of public policy and has just published '*Climate Change Adaptation Principles – Conserving Biodiversity in a Changing Climate*'. This builds on guidance for conservation practitioners '*Conserving Biodiversity in a Changing Climate - Building Capacity to Adapt*' published in 2007. The Climate Change Adaptation Principles will help people managing conservation

work to plan what actions they need to take now to help the natural world adapt to climate change. There are 5 main groupings which all include a number of principles, each giving more detail on what the conservation actions might be. These are:

- Take practical action now;
- Maintain and increase ecological resilience;
- Accommodate change;
- Integrate action across partners and sectors;
- Develop knowledge and plan strategically.

The Scottish Biodiversity Strategy also considers the impacts of climate change on biodiversity and highlights the need to maximize the connections between habitats and minimise the barriers to movement and dispersal.

3.3.9 Public Engagement

Engaging people and encouraging behavioural change is a shared action across the Country Partnerships.

In England, Natural England - as the delivery body for the England Biodiversity Strategy, is engaged on a programme of work with the objective that people are inspired to value and conserve the natural environment. This includes through leading major campaigns, for example, to raise awareness and understanding of the marine environment, and to understand the links between health and the natural environment.

In England, a Defra campaign is in preparation to advocate the benefits of conservation volunteering, to be launched later in 2009. Work by volunteers is important in taking forward many biodiversity objectives and is a good example of pro-biodiversity behaviour. There is scope to provide a more coherent position on the benefits of volunteering, make opportunities more easily accessible and to increase the number of people choosing to do volunteering which benefits biodiversity.

Defra provides financial support to an annual conference of environmental communications professionals, to support sharing of ideas and best practice about how to best engage the public, to support the sector in this aims generally.

The British Broadcasting Corporation (BBC) "Breathing Spaces" initiative aims, through television, radio and other media, to get one million more people actively engaged in activities to conserve wildlife. Schools are being encouraged to participate. More information is at <http://www.bbc.co.uk/breathingplaces/>.

The Wales Biodiversity Partnership has organized a dedicated nine days of local and national awareness action and events every year since 2002. This initiative is known as Wales Biodiversity Week; see <http://www.biodiversitywales.org.uk/wbw-121.aspx>.

Through Local Plan Partnerships, there is an opportunity for all sectors of the community to contribute to biodiversity action, with dedicated initiatives and support. A calendar of events is constantly updated; see http://www.biodiversitywales.org.uk/whats_on-4.aspx.

Over several years, the Wales Biodiversity Partnership and the Countryside Council for Wales, have worked with Arena Network to support small to medium sized businesses to recognize biodiversity in their sourcing of materials and production

processes. A dedicated website and advisor offer help to businesses to integrate biodiversity into environmental management standards.
<http://www.businessbiodiversitywales.co.uk/english/index.asp>

Scotland has a suite of biodiversity indicators, 5 of which are aimed at increasing public engagement. These are:

- Attitudes to biodiversity;
- Extent and composition of greenspace;
- Involvement in biodiversity conservation;
- Visits to the outdoors;
- Membership of biodiversity organizations.

They are monitored by SNH http://gateway.snh.gov.uk/pls/htmldb_cagdb1/snhlive.tai_disp_template_pkg.display_std_page?p_type_id=2&p_cat_id=2&p_topic_id=50&p_class=nnrs. The SNH website also has a biodiversity communications toolkit to help organizations promote biodiversity www.snh.org.uk/biodiversitycommstoolkit/index.html. A dedicated People and Communications Group has responsibility for promoting biodiversity conservation and engaging the public. The group is currently developing a strategy to encourage greater community engagement with biodiversity.

Scottish Biodiversity Week <http://www.snh.org.uk/biodiversityweek/default.asp> is an annual programme of events to promote public awareness and involvement in biodiversity conservation and celebrate International Biodiversity Day in May. First run in 2001, Biodiversity Week has grown and now has its own website, events calendar, photo competition and awards scheme.

Scotland's Biodiversity Communications Toolkit <http://www.snh.org.uk/biodiversitycommstoolkit/index.html> is an online resource to help organisations communicate about biodiversity with a clear and consistent voice. The toolkit provides key messages, facts and figures and guidance on how to use the media.

The Scottish Marine Wildlife Watching Code, launched in 2006, gives guidance for everyone who watches marine wildlife around Scotland to maximise their enjoyment while minimising disturbance to marine biodiversity. The Code is aimed at wildlife watchers on the sea, in the sea, and on the coast. By increasing their understanding of marine wildlife, it is hoped that people will be aware of how their behaviour affects the animals they have seen and reduces their impacts on marine biodiversity.

Botanic gardens and open access plant collections provide a great opportunity for public engagement; to inform the sectors of the public about international policy issues and how they relate to biodiversity and plants generally. For example, The Great Plant Hunt <http://www.greatplanthunt.org/>, developed by the Royal Botanic Gardens Kew and commissioned and funded by the Wellcome Trust, encourages children to explore the natural world and join other schools in the biggest ever school science project.

3.3.10 Evidence

A sound evidence base is essential to support effective conservation of biodiversity in the UK. Research and associated monitoring is required to:

- assess the current status and trends in biodiversity;

- understand the value of biodiversity and ecosystem services;
- understand the reasons for unfavourable status and decline in biodiversity;
- assess future vulnerability;
- and identify effective remedial measures and strategies;
- assess the outcomes and effectiveness of policy; and
- innovate in the way we collect, manage and use evidence to support policy and action.

In a nation as small as the UK, there are common strategic research and survey requirements across national boundaries. The UK Biodiversity Partnership will help to identify where collaboration at a UK level delivers the evidence base in the most efficient and cost effective way. Where appropriate, research and surveillance will be co-ordinated at a UK level in partnership between the four country administrations, the respective country agencies, the Joint Nature Conservation Committee (JNCC) and the UK Research Councils. In some cases, alignment and funding may be sought with European projects.

Understanding the current status and trends in biodiversity requires continuing support for, and development of, existing monitoring schemes covering major components of biodiversity such as breeding birds, butterflies, bats, cetaceans, and plants, together with periodic habitat surveys and biological recording, as part of a coherent UK monitoring framework and linking to international systems and integrating long-term observations of environmental change. Site condition will remain an important monitoring requirement and innovation may help this to be increasingly integrated with other surveillance activities. Further targeted efforts need to be made to fill knowledge gaps for priority species and habitats. While individual projects will be organised at a range of scales from local to international, to be most effective and efficient, they need to be co-ordinated at a UK level. This understanding will help the UK contribute to work programmes under the CBD such as forest biodiversity, biodiversity and climate change, and targets such as the Global Strategy for Plant Conservation, to produce working lists, assessments of conservation status and protocols for conservation.

In the marine environment, novel approaches will be required to close major gaps in knowledge on the location, extent and status of species, and habitats and human impacts. Survey work is difficult and expensive, requiring collaboration with agencies and industries operating in the marine environment. Climate change must be considered in the design of the marine protected network for UK waters.

Work to improve the quality and relevance of indicators will need to continue in order to allow assessment of biodiversity targets at country, UK and European scales and enable the UK to meet international reporting requirements. The UK is working to address weaknesses in the indicator frameworks relating to ecosystem services, ecosystem integrity and resilience, and genetic diversity. It is possible that soil biological indicators could give a front-line view of the impacts of land management on soil functioning. However, not enough is yet known on the relationship between soil biological community structure and functions to interpret changes in land management. Methods of monitoring soil biology are developing at a rapid rate, meaning that large robust datasets have yet to be assembled. A priority is, therefore, to undertake research and development on methods to quantify soil biodiversity and on linking structure to function in relation to the response of soil to environmental pressures.

Chapter IV - Conclusions: Progress towards the 2010 Target and Implementation of the Strategic Plan





Summary



The UK is fortunate in having lots of information about its biodiversity, collected across a broad spread of species and habitats by both professionals and amateurs for many years. These data are essential sources of evidence; for developing policies and targeting actions to conserve biodiversity; and for reporting on progress and understanding the reasons for change and the best options for conservation.

Chapter 4 uses a small set of biodiversity indicators to review progress in the UK towards the 2010 target and the global goals and targets agreed by the CBD. The chapter concludes with some views on the future orientation of the Convention.

4.1 Progress Towards the 2010 Target

Key to indicator assessment of change over time:

-  = Improving
-  = little or no overall change
-  = Deteriorating
-  = insufficient or no comparable data

PROTECTING THE COMPONENTS OF BIODIVERSITY							
<i>Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes</i>							
Global targets	UK contribution to global target	Relevant UK indicator and associated measures		Assessment of change for each measure		Summary of change	Related UK and national targets
				Long term [1]	Since 2000		
1.1: At least 10% of each	Over 2.4 million hectares of land and freshwater	6. Protected sites	Area of protected	 1996		The total area of land and sea protected in the UK has	No relevant UK targets

<p>of the world's ecological regions effectively conserved.</p>	<p>have been designated as protected areas under national and international legislation, representing about 10 % of the land area of the UK. A further one million hectares of UK coastal seas have also been designated. These areas have been selected to cover habitats and species of particular importance for the Atlantic biogeographic region. To ensure sites are representative of the entire region site selection is coordinated at a European level under the EU Habitats Directive. The UK is currently in the process of designating marine protected areas.</p>	<p>www.jncc.gov.uk/page-4241</p>	<p>sites</p>			<p>increased between 1996 and 2008 from 2.3 million to 3.5 million hectares - an increase of 48%. Since 2000 there has been a 12% increase</p>	
<p>1.2: Areas of particular importance to biodiversity protected</p>		<p>4. Priority habitats www.jncc.gov.uk/page-4239</p>	<p>Condition of features on protected sites</p>	<p>☹☹☹</p>	<p>☹☹☹</p>	<p>Sites are designated with the aim of conserving specific biological or geomorphological features. The condition of these features is assessed on a rolling cycle against agreed standards. The first set of biological feature assessments is used to compile the condition indicator. This shows that the percentage of features or area in favourable condition (or in unfavourable but recovering condition) is generally between 60 and 85 per cent, although it drops to 37 per cent for Special Areas of Conservation.</p>	<p>There are separate targets in each of the countries of the UK to achieve favourable or recovering condition on 95 per cent of designated sites, either by area or by number of features. The date for achieving this target varies between countries.</p>
				<p>☹☹☹</p>	<p>⚠</p>	<p>Priority Habitats are semi-natural habitats identified as priorities for conservation in the UK Biodiversity Action Plan. Based on a comparison of the earliest available and most recent assessment for each habitat, the number either 'stable' or 'increasing' in area has fallen from 21 to 20 (2.5 per cent of the</p>	<p>In the UK, action plans and conservation targets have been agreed for 65 priority habitats. Targets are included for maintenance and restoration.</p>

					known habitats). Despite this position of little or no overall change, 15 priority habitats (44 per cent) are still declining in extent.	
		14. Habitat connectivity www.jncc.gov.uk/page-4249	⊖⊖⊖	⊖⊖⊖	Indicator under development.	No relevant UK targets established.









Assessment of progress









Long term declines in habitat extent and quality have been addressed, and in some cases reversed.



Significant effort has been put into establishing an ecologically coherent series of protected areas across the UK providing protection for both nationally and internationally important species and habitats. The effectiveness of these protected areas is measured using a monitoring protocol which enables expert assessments to be made by operational staff of the statutory conservation agencies. The protected areas are part of the UK's approach to conserving its important habitats and species – and their role is balanced by legislative requirements to take biodiversity into account in decision making, not just in relation to protected areas but also with respect to the wider countryside and seas. Significant further investment is required in order to meet targets beyond 2010 for all priority habitats.

Goal 2. Promote the conservation of species diversity

Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets	
			Long term [1]	Since 2000			
2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.	At a global scale, the IUCN Red Data Books list 51 species found within the UK that are vulnerable, endangered or critically endangered: marine fish and marine mammals are quite	1a. Populations of key species (birds) www.jncc.gov.uk/page-4235	Farmland (19 species)	⊖ 1970	⊖	Between 1970 and 2007 there was a decrease in the populations of breeding farmland, water and woodland birds of 48 per cent, 6 per cent and 21 per cent respectively. Over the same period the populations of breeding seabirds have increased by 31 per cent.	Scotland aim to increase the index of abundance of terrestrial breeding birds
			Woodland (38 species)	⊖ 1970	⊖		
			Seabirds (20 species)	⊕ 1970	⊖		

<p>prominent.</p> <p>Of the 1,150 species recently identified as part of the UK Biodiversity Action Plan as the priorities for national conservation action, 18% (211 species) have UK populations representing more than 25% of the total for the EU Atlantic biogeographic region. These are broken down as follows: Birds 23; Mammals 1; Invertebrates 56; Higher Plants 52; Lower Plants 71; Other 8.</p> <p>The UK BAP list of priority species includes 22 species covered by UK indicators relevant to global target 2.1: 7 farmland birds, 4 woodland birds, 3 wintering waterbirds, 6 butterflies and 2 bats.</p>		Water and Wetland birds (26 species)	 1975		Since 2000, the populations of breeding farmland and seabirds have fallen, whilst breeding woodland and waterbird indicators have shown little or no overall change. The overall trends tend to mask, to a certain extent, ongoing declines for some of the more specialized birds included in the indicators.		
		Wintering waterbirds (46 species)	 1975		Between 1975/6 and 1996/7 wintering waterbirds increased by 66 per cent but then stabilised and subsequently fell to 57 per cent of the baseline by 2006/7.	No relevant UK targets	
		1b. Populations of key species (butterflies) www.jncc.gov.uk/page-4236	Specialist species (25 species)	 1976		Large fluctuations in numbers between years is a typical feature of butterfly populations. Since 1976, the measures for populations of specialists and generalists show apparent declines of 70 per cent and 45 per cent respectively. Analysis shows that since 1976 the measure for specialists has declined significantly but the measure for wider	No relevant UK targets
			Wider countryside species (24 species)	 1976			

<p>The Millennium Seed Bank Project (MSBP), hosted by the Royal Botanic Gardens in Kew, is the largest <i>ex situ</i> conservation project ever conceived. Its partners will have banked seed from 10% of the world's wild plant species by the end of the decade. These will include the rarest, most threatened and most useful species known to man.</p>					<p>countryside species has shown little or no overall change (despite the apparent decline). Since 2000 the measure for specialists shows an apparent decline from 37 per cent to 30 per cent of the 1976 baseline. The measure for wider countryside butterflies has shown a similar apparent decline from 76 per cent to 55 per cent of the baseline. The underlying analysis shows that there is little or no overall change for either measure despite the apparent declines.</p>		
	1c. Populations of key species (bats) (6 species) www.jncc.gov.uk/page-4271			 1978		<p>Bats have undergone severe declines historically. However since 2000, bat populations have increased by 21 per cent.</p>	No relevant UK targets
	2. Plant diversity www.jncc.gov.uk/page-4237	Arable & Horticulture		 1990-1998		<p>Within arable fields there was an increase in plant species richness both in the longer term (1990 – 2007) and shorter term (1998 – 2007). In woodlands and grasslands plant diversity has declined in both the longer and shorter term. For neutral grassland, broadleaf</p>	No relevant UK targets
		Woodland		 1990-1998			
Boundary			 1990-1998				

						<p>woodland and improved grassland, plant species richness fell over the longer term by 19, 7 and 5 per cent respectively and by 10, 2 and 3 per cent since 2000.</p> <p>In boundaries, plant species richness of the ground flora has also declined in both the long and shorter term. For streamsides, field boundaries and hedgerows plant species richness fell over the longer term by 13, 6 and 5 per cent respectively and by 7, 3 and 5 per cent since 2000.</p>	
2.2: Status of threatened species improved.		3. Priority species www.jncc.gov.uk/page-4238				<p>Based on a comparison of the earliest available and most recent assessment for each species, the number either 'stable' or 'increasing' in number or extent has risen by 3.5 per cent from 202 to 214. The number decreasing (or lost) fell from 137 to 125. Despite this modest improvement, the number of species assessed as 'increasing' has fallen from 48 to 45, 88 are still declining and 6 have been lost from</p>	<p>The UK Government and Devolved Administrations agreed specific targets for the original 391 UK Biodiversity Action Plan priority species/ species groups.</p>

					the UK since the Plan was published in 1994. Even those that are stable may have populations well below target levels.
<p>Assessment of progress</p> <p>Long term declines in species populations have been addressed and in some cases reversed.</p> <p>Where records of species abundance and/or distributions exist they show a marked decline particularly in the second half of the Twentieth Century. Farmland and woodland birds, for example, declined rapidly during the late 1970s and 1980s. However these rapid declines have been reduced, and in some instances stabilized since 2000. For some species of particular conservation focus (e.g. corncrake <i>Crex crex</i>, cirl bunting <i>Emberiza cirlus</i>, otter <i>Lutra lutra</i>) declines have been reversed, demonstrating the benefits of concerted conservation work.</p> <p>A review of the UK Biodiversity Action Plan in 2007 identified 1,150 priority species that will provide a focus for conservation action over the next decade.</p>					

Goal 3. Promote the conservation of genetic diversity						
Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets
			Long term [1]	Since 2000		
3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge	In 2006, the UK Government published the UK National Action Plan for Farm Animal Genetic Resources (NAPFaGR). www.defra.gov.uk/farm/livestock/strategy/genetic-res/pdf/fangr-actionplan.pdf . The Plan aims to conserve the UK's diversity of livestock breeds – over 130 native breeds of	5. Genetic diversity www.jncc.gov.uk/page-4240 Native Sheep Breeds Native Cattle Breeds	☹☹☹ ☹☹☹	☹☹ ☑	The indicator presents the change in genetic diversity in UK breeds of cattle and sheep between 2001 and 2007, as shown by the effective population size. Effective population size accounts for the total number of animals in a breed population and the likely relatedness to other animals with	The UK NAPFaGR contains no specific targets but has detailed actions to improve the evidence base for farm animal genetic diversity. RBG Kew's Millennium Seed Bank project aims to collect and conserve 10% of the world's wild plant species by

<p>maintained.</p>	<p>poultry, cattle, sheep, goats, pigs, horses and ponies in total, of which approximately 100 are at risk In 2007 the UK (DfID) committed £10 million over 4 years to the Global Crop Diversity Trust</p>			<p>which they breed. A low effective population size signifies a greater likelihood of in-breeding and risk of loss of genetic diversity. The indicator shows the change in the average effective population size for the breeds most at risk of loss of genetic diversity. The mean effective population size has risen by 4.5 individuals for sheep breeds (12%) and by 8.3 individuals for cattle (32%). This encouraging change for breeds of sheep is not definitive, because of the variability in the data. There has been no reported UK extinction of any breed of sheep or cattle since 2001.</p>	<p>2010, and 25% by 2020.</p>
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Assessment of progress



Good progress in documenting and addressing the causes of genetic decline in domestic animals. Good progress in bringing plant genetic diversity into *in-situ* collections.

The UK farming industry has a significant history of animal and plant breeding. Many traditional breeds were developed in the agricultural revolution of the 18th and 19th Centuries. More recent farm specialisation and intensification led to many of these breeds becoming marginalised, though they continue to be of specialist use. One of the results of the development of the CBD has been a more official recognition of the importance of these breeds both for their present utility in managing conservation landscapes, and of the future utility that such breeds may offer for new breeding programmes. UK institutions and individuals have had a long history of collecting and managing genetic resources. The UK is using this experience to help other countries develop capacity, and to help conserve not just its own genetic diversity, but also the genetic diversity

of other countries; for example through the Millennium Seed Bank (MSB). Examples of achievements in this area are that all of the UK seed bearing flora have been conserved in the MSB and that “traditional orchards” including many rare and threatened fruit varieties have been identified as a new UK BAP priority habitat. The UK, through the Department for International Development, also contributes funding to the Global Crop Diversity Trust which will help the Trust in its efforts to bank staple food seeds for the world’s 21 major food crops.

PROMOTING SUSTAINABLE USE								
<i>Goal 4. Promote sustainable use and consumption.</i>								
Global targets	UK contribution to global target	Relevant UK indicator and associated measures		Assessment of change for each measure		Summary of change	Related UK and national targets	
				Long term [1]	Since 2000			
4.1: Biodiversity-based products derived from sources that are sustainably managed, and Production areas managed consistent with the conservation of biodiversity.	Approximately 76% of the UK land area is used for agriculture, and 11.6% for forestry. However the UK imports approximately 39% of its food. In 2006, 26 countries together accounted for 90% of UK food imports. UK production of round wood totalled 8.6 million m ³ in 2005. A further 52.5 million m ³ of wood and wood products were imported to the UK and 16.5 million m ³ were exported, giving apparent consumption of 44.7 million m ³ .	7. Woodland management www.jncc.gov.uk/page-4242				Across the UK, the percentage of woodlands under certified management schemes increased from 37 per cent in 2001 to 45 per cent in 2008. Within the UK in 2008, the percentage of woodlands certified in England was 30 per cent, 43 per cent in Wales, 55 per cent in Scotland and 74 per cent in Northern Ireland.		
		8. Agri-environment land www.jncc.gov.uk/page-4243	Higher Type Schemes		1992		In 2008 the total area of land in higher level or targeted agri-environment agreements in the UK was 3.1 million hectares, equivalent to 18 per cent of UK	In England, an uptake target of 70% of eligible farmland to be in an agri-environment scheme by 2011 has been agreed between Defra and Natural
			Entry Type Schemes					

						<p>agricultural land. There were 5.3 million hectares in entry level schemes in England and Wales.</p> <p>In England, 13 per cent of agricultural land is managed under a higher level or targeted schemes; 27 per cent in Wales; 19 per cent in Scotland and 43 per cent in Northern Ireland.</p> <p>In England 54 per cent of agricultural land is managed under an entry level agreement and 20 per cent in Wales. These are whole farm schemes, the England area includes land in Organic ELS.</p>	England.
		<p>15. Biological river quality www.jncc.gov.uk/page-4250</p>	 1990		<p>In 2006 the percentage of rivers of good biological quality in England was 71 per cent, up from 60 per cent in 1990 and 67 per cent in 2000. In 2006, 54 per cent of rivers in Northern Ireland and 81 per cent of rivers in Wales were of good biological quality.</p> <p>In Scotland, the percentage of rivers of good quality in 2006</p>		

					was 88 per cent. Between 2000 and 2006, this figure was stable between 86 per cent and 88 per cent, based on a combined chemical, biological and aesthetic assessment.	
4.2 Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced.	The UK has significant marine area within its territory; the continental shelf administrative area is 871,771 km ² . Fishing is an important industry, so restoring fish stocks to sustainable levels will be an important contribution to the global target. Other forms of unsustainable use of biodiversity e.g. hunting and extractive uses are relatively minor, and well regulated.	9. Sustainable fisheries www.jncc.gov.uk/page-4244	 1990		During the 1990s the percentage of fish stocks considered to be harvested sustainably was around 10 per cent. In 2000, it was 5 per cent, but has increased to 25 per cent in 2007. Despite these increases, between 70 to 75 per cent of UK fish stocks have either reduced reproductive capacity or have been harvested unsustainably each year since 2001	Scotland will ensure 70% key commercial fish stocks at full reproductive capacity and harvested sustainably by 2015.
4.3: No species of wild flora or fauna endangered by international trade.	The UK has substantial trade in wild fauna and flora but the considerable effort is placed in ensuring that all trade is compliant with CITES is an important		No UK relevant UK indicators at present.			

	contribution to the global target. 26,813 CITES licences were issued in 2008.			
<p>Assessment of progress</p> <p>Good progress is being made. However, it should be noted that the assessment of the indicators is based on their trends, not on whether targets ultimate goals are being met. Thus, although the proportion of fish stocks harvested sustainably has increased, and is therefore assessed as a green traffic light, around 75% of assessed fish stocks are fished unsustainably.</p> <p>The UK is a strong proponent for the use of EU Common Agricultural Policy (CAP) funds to be delivered for achieving environmental benefits, rather than just for production support. The Rural Development Programmes (RDP) of each of the UK countries aim to achieve this through new agri-environment schemes. The UK is working towards implementing the Non-Legally Binding Instrument on all types of Forests and work globally, regionally and nationally towards achieving the global objectives on forests by 2015. The Department for International Development (DfID) has established a Forest Governance and Trade Programme, a five-year (2006-2011), £24 million programme that aims to tackle the problems of illegal logging in developing countries of Africa and Asia and the associated international trade in illegally logged timber. Its main activity is supporting reforms in countries that enter Voluntary Partnership Agreements (VPAs) with the European Union under the FLEGT Action Plan. Defra has a joint international programme with DfID supporting fisheries governance in developing countries and combating illegal, unreported and unregulated fishing internationally. In addition Defra is involved in the management of international fish stocks through its role in Regional Fisheries Management Organisations. The UK takes care that any CITES licences issued will not impact adversely on wild populations of the species concerned.</p> <p>Information on the sources of UK food, and statistics relating to the UK foodchain can be found in the Food Statistics Pocketbook: https://statistics.defra.gov.uk/esg/publications/pocketstats/foodpocketstats/FoodPocketbook2008.pdf. Information on the extent of UK forestry and trade in forestry commodities can be found at: http://www.forestry.gov.uk/website/ForestStats2006.nsf/byunique/woodland.html#two.</p>				

ADDRESSING THREATS TO BIODIVERSITY						
<i>Goal 5. Pressures from habitat loss, land use change and degradation, and unsustainable water use, reduced</i>						
Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets
			Long term [1]	Since 2000		
5.1. Rate of loss and degradation of natural habitats decreased.	The UK has biogeographically significant proportions of some habitats especially marine (e.g. estuaries, coastal	4. Priority habitats www.jncc.gov.uk/pag-e-4239	⊖	⊕	Priority Habitats are semi-natural habitats identified as priorities for conservation in the UK Biodiversity Action Plan.	In the UK, action plans and/or conservation targets have been agreed for 65 priority habitats. Targets are included

	<p>cliffs, deep sea reefs etc), and wet temperate western seaboard habitats such as western oakwoods and machair. All of these are covered by the maintenance and restoration targets set for the UK Biodiversity Action Plan priority habitats</p>				<p>Based on a comparison of the earliest available and most recent assessment for each habitat, the number either 'stable' or 'increasing' in area has fallen from 21 to 20 (2.5 per cent of the known habitats). Despite this position of little or no overall change, 15 priority habitats (44 per cent) are still declining in extent.</p>	<p>for maintenance and restoration.</p>	
		<p>6. Protected sites www.jnc.c.gov.uk/page-4241</p>	<p>Condition of features on protected sites</p>	<p>☹☹☹</p>	<p>☹☹☹</p>	<p>Sites are designated with the aim of conserving specific biological or geomorphological features. The condition of these features is assessed on a rolling cycle against agreed standards. The first set of biological feature assessments is used to compile the condition indicator. This shows that the percentage of features or area in favourable condition (or in unfavourable but recovering condition) is generally between 60 and 85 per cent, although it drops to 37</p>	<p>There are separate targets in each of the Countries of the UK to achieve favourable or recovering condition on 95 per cent of designated sites, either by area or by number of features. The date for achieving this target varies between Countries.</p>

					per cent for Special Areas of Conservation.	
		14. Habitat connectivity www.jncc.gov.uk/page-4249	⊙	⊙	Indicator under development	No relevant UK targets

Assessment of progress

Significant pressures have been addressed, with a concomitant improvement in status of some of the priority habitats in the UK BAP. However, more remains to be done.

The results from Countryside Survey http://www.countryside.gov.uk/pdf/reports2007/CS_UK_2007_Ch02_rev2.pdf generally show a shift along an ecological gradient of succession in Great Britain, perhaps a consequence of vegetation responding to a reduced intensity of management. The area of broadleaved woodland, improved grassland, neutral grassland, acid grassland and standing waters Broad Habitats increased in the UK between 1998 and 2007. Arable and bracken decreased. The area of all other Broad Habitats showed no change. Competitive plant species increased in the open countryside (fields, woods, heaths and moors) and in areas targeted for their botanical interest in Great Britain between 1978 and 2007, whilst ruderal species decreased. In linear features, stress tolerating plant species increased and ruderal species decreased. Plant species preferring wetter conditions increased in all types of vegetation sampling plots, continuing the trend from 1990. Species preferring fertile and shady conditions increased from 1998 to 2007 in linear features and in areas targeted for their botanical interest. Species preferring more fertile conditions decreased in the open countryside.

Goal 6. Control threats from invasive alien species						
Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets
			Long term [1]	Since 2000		
6.1. Pathways for major potential alien invasive species controlled.	2,721 non-native species have been recorded in England, and 988 in Scotland. However only a small minority become invasive.	11. Invasive species www.jncc.gov.uk/page-4246	Freshwater	⊗ 1960	⊙	Over the period 1990-2007, the proportion of records of non-native species in samples of birds, mammals, plants and marine life rose by about 23 per cent. Out of 3,500 non-native species in Britain, the 49 with the greatest potential impact on native biodiversity were
6.2. Management plans in place for major alien species that threaten ecosystems, habitats or			Marine	⊗ 1960	⊗	
			Terrestrial	⊗ 1960	⊗	

species.				identified for this indicator. The number of these 'most invasive' non-native species established in or along more than 10 per cent of Great Britain's land area or coastline has increased since 1960 in the freshwater, terrestrial and marine environment, increasing the likely pressure on native biodiversity.	
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Assessment of progress

Poor progress in combating the impacts of invasive non native species. While invasive alien species have been recognised as a significant threat to native biodiversity and efforts are being made to be more proactive in identifying and acting on potential threats early, existing invasive aliens continue to spread. Most non-native species are considered benign or positive but a few have a negative impact on native species through the spread of disease, competition for resources or by direct consumption, parasitism or hybridisation. Invasive non-native species have one or more of these negative impacts and a high capacity for spread to natural and semi-natural habitats.

The GB invasive non-native species framework strategy was launched in May 2008. The UK was amongst the first in Europe to have a comprehensive strategy on this very significant biodiversity threat. Invasive non-native species like Japanese knotweed (*Fallopia japonica*) and grey squirrels (*Sciurus carolinensis*) can impact on native species and habitats in a number of ways, as listed above. This strategy is based on internationally agreed advice and principles, and has received widespread support from stakeholders. Its core premise is that agreed under the Convention on Biological Diversity: of firstly seeking to prevent introductions; then swift action against those that are found early; and, finally, effective longer-term management of those that are already established. Following on from the Invasive Species in Ireland Report the Northern Ireland Environment Agency (NIEA) in partnership with the National Parks and Wildlife Service, Dublin (NPWS) jointly initiated the 'Invasive Species in Ireland Project' in 2006 to address the issues on an island of Ireland context. The UK Government has also supported projects to control alien invasive species in its Overseas Territories, through the Overseas Territories Environment Programme. Successful control has been backed up with projects to restore habitats and native species.

Goal 7. Address challenges to biodiversity from climate change, and pollution

Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets
			Long term [1]	Since 2000		
7.1. Maintain and enhance resilience of the components of biodiversity to adapt to climate change.	Predicted changes to the UK's climate are likely to have impacts on species ranges, preferred habitats and behaviour. Many species are already showing evidence of northward extension in their distribution in the UK and early work suggests that up to 75% of all species ranges might be primarily determined by climate variables (see chapter 1.10 para 2) and therefore at high risk of impact from climate change. These impacts seem to be particularly pronounced for the marine environment and associated coastal squeeze caused by sea level rise in conjunction with high development pressures on coasts. For	12. Spring index www.jncc.gov.uk/page-4247	Not assessed	Not assessed	This is a 'context' indicator which demonstrates the effects of climate change on the timing of biological events (i.e. phenology) for selected species. The trends in the indicator are not used to assess progress towards the 2010 target.	No current UK targets specific to climate change,
		14. Habitat connectivity www.jncc.gov.uk/page-4249	⊙⊙⊙	⊙⊙⊙	Indicator under development	No current UK targets but some habitat restoration targets aim to increase resilience. (e.g. hedges, rivers)





	example, it is estimated that an average of 100 ha of saltmarsh is being lost every year in the UK as a result of coastal squeeze.						
7.2. Reduce pollution and its impacts on biodiversity.	UK emitted 0.59 million tonnes of SO _x , 289,000 tonnes of NH ₃ , and 1.49 million tonnes of NO _x in 2007. The UK accounted for 8.5% SO _x , 8% NH ₃ , and 14.4% NO _x of the EU27 totals in 2006.	10. Impact of air pollution www.jncc.gov.uk/page-4245	Acidity	 1996		In 1996, the percentage area of sensitive habitats where acid deposited exceeded critical loads was 73 per cent. Between 2000 and 2005 this declined from 60 per cent to 58 per cent.	The EU Emission Ceilings Directive obligates the UK to meet targets of 0.585 million tonnes of SO _x , 297,000 tonnes of NH ₃ , and 1,167 million tonnes of NO _x by 2010.
			Nitrogen	 1996		The percentage of semi-natural habitat area where eutrophying pollutants exceeded critical loads was 66 per cent in 1996. It decreased to 59 per cent in 2000 and increased to 61 per cent by 2005.	

Assessment of progress

Climate change is having an observed direct impact on UK biodiversity. While the indicator has fluctuated from year to year, on average spring events in the UK occurred seven days earlier in the year between 1999-2008 than between 1900-1947. These changes in the Spring Index are strongly linked to increases in temperature in March and April. Species with southerly distributions have been observed moving northwards. For example the gatekeeper butterfly (*Pyronia tithonus*) is expanding its range in Britain and the little egret (*Egretta garzetta*) previously resident in Northern France, is now colonizing Southern England. Information on the changing distribution of many species in the UK can be found by searching on the National Biodiversity Network <http://data.nbn.org.uk/>.

Good progress is being made to reduce the threat of acid rain, and to address point source pollution, but diffuse pollution leading to eutrophication remains a problem for many habitats. The UK is on track to meet EU emission reduction targets for SO_x and NH₃, but is projected to miss the target for NO_x in 2010 unless more action is taken. Substantial effort has been put in by regulatory authorities to reducing point source pollution

(e.g. end of pipe emissions, but diffuse pollution has proved less tractable.

MAINTAINING GOODS AND SERVICES FROM BIODIVERSITY TO SUPPORT HUMAN WELL BEING						
<i>Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods</i>						
Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets
			Long term [1]	Since 2000		
8.1. Capacity of ecosystems to deliver goods and services maintained.	UK is undertaking a sub-global National Ecosystem Assessment, following the approaches used in the Millennium Ecosystem Assessment. UK has undertaken a review of national targets and indicators relevant to the implementation of an ecosystem approach.	13. Marine ecosystem integrity http://www.jncc.gov.uk/page-4248	 1982		There has been a steady decline in the proportion of large fish, by weight, in the northern North Sea since 1982. The proportion fell from around 15 per cent of the fish community in 1982 to around 5 per cent between 1982 and 2008, although there has been little overall change since 2000. This broad pattern of general decline, followed by a more recent period of apparent stability is repeated in other seas around the UK.	
		15. Biological river quality http://www.jncc.gov.uk/page-4250	 1990			

					<p>per cent in 2000. In 2006, 54 per cent of rivers in Northern Ireland and 81 per cent of rivers in Wales were of good biological quality.</p> <p>In Scotland, the percentage of rivers of good quality in 2006 was 88 per cent.</p> <p>Between 2000 and 2006, this figure was stable between 86 per cent and 88 per cent, based on a combined chemical, biological and aesthetic assessment.</p>
8.2. Biological resources that support sustainable livelihoods, local food security and health care, especially of poor people maintained.	UK has supported four situation analysis in developing countries for projects on Ecosystem Services and Poverty Alleviation	No relevant UK indicators at present			
<p>Assessment of progress</p> <p>Good progress is being made to improve the quality of rivers. Moderate progress is being made on marine ecosystem integrity based on the proportion of the catch over 40cm in length; this appears to have stabilised in recent years.</p> <p>The UK is launching a major research programme (Ecosystem Services for Poverty Alleviation) on the theme of Ecosystem Services and Poverty Alleviation in 2009 funded by DfID, NERC and ESRC. The UK also committed £50 million in 2007 for sustainable management of the Congo Basin. The Fund is intended to slow the rate of deforestation, through developing the capacity of the people and institutions in the countries of the Congo basin to manage their forest including helping local communities find livelihoods that are consistent with forest conservation.</p>					

PROTECTING TRADITIONAL KNOWLEDGE, INNOVATIONS AND PRACTICES						
<i>Goal 9. Maintain socio-cultural diversity of indigenous and local communities</i>						
Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets
			Long term [1]	Since 2000		
9.1. Protect traditional knowledge, innovations and practices.	The UK has little self-interest in 8j issues but recognizes and is mindful of others interests.	No relevant UK indicators at present				No relevant UK targets
9.2. Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing.		No relevant UK indicators at present				No relevant UK targets.
Assessment of progress						
No assessment possible.						

ENSURE THE FAIR AND EQUITABLE SHARING OF BENEFITS ARISING OUT OF THE USE OF GENETIC RESOURCES						
<i>Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources</i>						
Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets
			Long term [1]	Since 2000		
10.1. All access to genetic resources is in line with the Convention on Biological Diversity and its relevant provisions.	The UK has not introduced specific legislation in response to the CBD to regulate access to genetic resources. Rather, the rules governing access to genetic resources are found in other areas of UK law, Defra has nominated an ABS Focal Point to help parties seeking access to Genetic Resources within the UK.	No relevant UK indicators at present				
10.2. Benefits arising from the	Defra and the Royal Botanic	No relevant UK indicators at present				

commercial and other utilization of genetic resources shared in a fair and equitable way with the countries providing such resources in line with the Convention on Biological Diversity and its relevant provisions	Gardens, Kew promote the Bonn Guidelines as best practice for companies and individuals engaged in bioprospecting		
Assessment of progress			
No assessment possible.			

ENSURE PROVISION OF ADEQUATE RESOURCES

Goal 11: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention

Global targets	UK contribution to global target	Relevant UK indicator and associated measures	Assessment of change for each measure		Summary of change	Related UK and national targets
			Long term [1]	Since 2000		
11.1. New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments	The UK's per capita GDP (£2,727,806) was ranked 5 th by the World Bank in 2007. In the calendar year 2008 the UK reported £6,306m as official development	<p>16. UK Biodiversity Expenditure http://www.jncc.gov.uk/pa-ge-4251</p> <p>17. Global biodiversity expenditure http://www.jncc.gov.uk/pa-ge-4252</p> <p>18. Volunteer time http://www.jncc.gov.uk/pa</p>	<p>⊖⊖⊖</p> <p>⊖⊖⊖</p> <p>⊖⊖⊖</p>	<p>⊙</p> <p>⊙</p> <p>⊙</p>	<p>In 2007/8, £525 million pounds of public sector funding was spent on UK biodiversity.</p> <p>Since 2000/1 public sector spending on UK biodiversity has increased by 112 per cent.</p> <p>In 2007/8 UK funding for global biodiversity</p>	No relevant UK targets

<p>under the Convention, in accordance with Article 20.</p>	<p>assistance (ODA), making the UK the third largest OECD-DAC donor on this internationally agreed classification of aid. The UK's ODA/ GNI ratio for 2007 was 0.43 per cent. The UK is also one of the largest donors to the GEF (£35 million per year)</p>	<p>ge-4253</p>			<p>totalled £54 million. Global spending by the UK public sector has increased by 85 per cent since 2000/1 in real terms. During the same period UK GDP has grown by 19 per cent. Between 2000 and 2008 there was a 50 per cent increase in time spent volunteering, and in 2008 the total time spent was equivalent to around 750,000 working days.</p>	
<p>11.2. Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4.</p>	<p>Darwin Initiative projects are collaborative, involving partnerships between UK institutions and developing country bodies. As such, there is a focus on transfer of technology. In 2007, 18% of closed projects reported implementation contributing to Article 16, a figure expected to be an</p>	<p>No relevant UK indicators at present</p>				

	underestimate due to the fact the projects contribute to multiple CBD articles.		
<p>Assessment of progress</p> <p>Good progress; the UK has continued to increase the resources available, both within the UK, and for global programmes. A significant amount of input is made by individuals in their own time volunteering to aid conservation projects in the UK.</p> <p>The UK is the 4th largest donor to the Global Environment Facility (GEF), providing steadily increasing resources from £90 million (GEF1) to £140 million for GEF 4. The UK also contributes £1 million per year to biodiversity conservation in the overseas territories through the DfID/FCO overseas territories environment programme; and £60 million (over 3 years) to forest conservation in the Congo Basin. Key statistics on the UK's expenditure on overseas development aid is available at http://www.dfid.gov.uk/news/files/pressreleases/statsrelease-2009.asp.</p>			

[1] The earliest available year is used as the baseline for assessment of long term change. The base year used for each measure is shown in the table. Where data are unavailable, or do not precede 1996, a long term assessment is not calculated.

4.2 Progress towards the Goals and Objectives of the Strategic Plan of the Convention

4.2.1 Introduction

The UK national contribution to achieving the goals and objectives of the Strategic Plan is delivered under the umbrella of the UK Biodiversity Action Plan (UKBAP) and associated country biodiversity/environment strategies for England, Northern Ireland, Scotland and Wales (see chapter II). All of these plans and strategies are developed and implemented through a cross-sectoral, partnership approach that is replicated at all relevant geographic scales and sectoral levels (see chapter III). Goals and objectives are set throughout the process and are reported on in a coordinated manner. An online system for reporting (<http://www.ukbap-reporting.org.uk/default.asp>) has been developed to assist reporting of progress within such a localised and cross-sectoral style of delivery.

In addition to national action, the UK also contributes to the achievement of some of the capacity building and technical cooperation activities of other parties through scientific and technical cooperation (for example through the Darwin Initiative). Capacity building more generally is assisted through the inclusion of biodiversity related concerns within many UK overseas aid initiatives.

4.2.2 Assessment of the UK contribution to and progress towards each of the objectives of the Convention on Biological Diversity Strategic Plan:

<i>Goal 1: The Convention is fulfilling its leadership role in international biodiversity issues</i>
<i>1.1 The Convention is setting the global biodiversity agenda</i>
<i>1.2 The Convention is promoting cooperation between all relevant international instruments and processes to enhance policy coherence</i>
<i>1.3 Other international processes are actively supporting implementation of the Convention, in a manner consistent with their respective frameworks</i>
<i>1.4 The Cartagena Protocol on Biosafety is widely implemented</i>
<i>1.5 Biodiversity concerns are being integrated into relevant sectoral or cross-sectoral plans, programmes and policies at the regional and global levels</i>
<i>1.6 Parties are collaborating at the regional and subregional levels to implement the Convention</i>
Objectives 1.1, 1.2 and 1.3 all relate to the effectiveness of the Convention on Biological Diversity in representing biodiversity concerns on the international stage and within the work of other international conventions.
Detail of implementation of the Cartagena Protocol (Objective 1.4) is provided under goals 2.4, 3.2 and 4.2.

Objectives 1.5 and 1.6 are about Parties engaging in regional and sub-regional implementation activities. The UK undertakes these regional aspects of its biodiversity work as a member of the European Union. This includes:

- Contribution to the EU Biodiversity Action Plan,
- Development of EU Biodiversity Indicators (SEBI2010 initiative),
- Establishment of a European Network of Protected Areas (Natura 2000),
- EU legislation in the form of the Habitats Directive, Birds Directive and Water Framework Directive, and
- Regular exchange of good practice and ideas at all scales of implementation.

The EU is divided into biogeographic regions (sub-regions) with sufficiently similar and distinct biodiversity and issues to make co-ordination of activities worthwhile.

Goal 2: Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention

2.1 All Parties have adequate capacity for implementation of priority actions in national biodiversity strategies and action plans

The UK was one of the first countries to produce a national biodiversity action plan (www.ukbap.org.uk, first published in 1994). The UK BAP is a robust document that has stood the test of time and has driven many conservation successes (Defra, 2007: <http://www.defra.gov.uk/wildlife-countryside/pdfs/biodiversity/ConBioUK-Oct2007.pdf>).

The UK has a wealth of scientific and technical expertise. It is involved in many international programmes of work to help to share this expertise, for example through the Darwin Initiative (see 2.5 for details).

One of the suite of UK Biodiversity Indicators concerns expenditure on biodiversity in the UK by the public sector and non-governmental organisations (<http://www.incc.gov.uk/page-3970>). Since 2000/01 there has been a year-on-year increase in biodiversity expenditure from the public sector in real terms, resulting in an overall increase of 112% (over the same period GDP increased 19%). In 2007/08, £525 million of public sector funding was spent on biodiversity.

2.2 Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition, have sufficient resources available to implement the three objectives of the Convention

The UK's White Paper on International Development²⁷, published in July 2006, emphasises the centrality of sustainable development and good environmental management to the Department for International Development (DfID) overarching goals of poverty reduction and meeting the MDGs. Consequently DfID channels

²⁷ Eliminating World Poverty: making Governance Work for the Poor, UK White Paper on International Development, July 2006.

significant resources to environmental management (including biodiversity) in developing countries and is currently reviewing its own environmental screening process to improve effectiveness and learn from others, with the intention of safeguarding environmental considerations in the delivery of development planning and policies.

The GEF is the financial mechanism for the CBD and the UK is the fourth largest donor (after the USA, Japan and Germany). The UK's contributions have steadily increased, from £90 million in the first round to £140 million in the current replenishment. The UK also contributes around £1 million per year to biodiversity conservation in the UK's overseas territories and £60 million over 4 years to forest conservation in the Congo Basin.

2.3 Developing country Parties, in particular the least developed and the small island developing States amongst them, and other Parties with economies in transition, have increased resources and technology transfer available to implement the Cartagena Protocol on Biosafety

The UK has made available financial resources, both through funding expert groups under the Protocol and paying the travel expenses of delegates from developing countries, aiding their participation.

Further details are available under Article 22, 'Capacity-building', in both the UK's and European Communities' First Regular National Reports on the Implementation of the Cartagena Protocol on Biosafety, available via <http://www.cbd.int/biosafety/parties/national-reports.shtml>.

2.4 All Parties have adequate capacity to implement the Cartagena Protocol on Biosafety

The European Union and the Member States signed the Protocol in May 2000, it was ratified by the European Community in August 2002. The UK's National Focal Point for the Protocol is based at the Department for Environment, Food and Rural Affairs (Defra) within the Genetic Modification Policy Team. For details of the measures for implementation of the Protocol in the UK see objective 3.2.

2.5 Technical and scientific cooperation is making a significant contribution to building capacity

In 1997 the UK Overseas Development Administration was replaced by the Department for International Development (DfID) <http://www.dfid.gov.uk/>, headed by a Secretary of State with cabinet rank, assisted by (from June 2003) a Minister of State and (from June 2007) three Parliamentary Under Secretaries of State.

DfID oversees the UK's work towards the Millennium Development Goals, working in partnership with governments, civil society, the private sector and others. It also works with multilateral institutions, including the World Bank, United Nations agencies, and the European Commission. Working with over 150 countries worldwide DfID had a budget of £5.3 billion in 2007-08. The budget is planned to increase to £7.9 billion by 2010-11.

The focus of donor agencies on direct budget support as a key mechanism for aid

delivery means that UK aid is channelled in response to country demand. Biodiversity is often not prioritised by recipient countries in national poverty reduction strategies. Recognising this, DfID has engaged in efforts to build the capacity of developing countries to mainstream environmental priorities. DfID works both at country level and through partnerships internationally to support better management of environmental resources including forests, fisheries and biodiversity. This has included:

- Significantly increasing the amount of quality information available to policymakers on how natural resources and environmental services support economic growth;
- Providing specific and practical policy advice on measures necessary to sustain economic growth in the medium to long term;
- Strengthening both the amount and quality of the dialogue between Ministries of Finance and Environment/Natural Resource Ministries.

DfID support to the UNEP/UNDP Poverty Environment Initiative is helping to scale up this approach across an increasing number of countries. In addition, the DfID-supported Ecosystem Services for Poverty Alleviation (ESPA) research programme will tackle complex problems associated with the sustainable management of ecosystems, for poverty reduction. The work builds on the findings of the Millennium Ecosystem Assessment. It will help developing countries to formulate and manage successful research projects, and develop better tools to assess ecosystem services and their impacts on human well-being.

In addition, DfID's Civil Society Challenge Fund – which not specifically directed towards biodiversity – is funding a number of projects that seek to build local capacity for natural resources management (particularly forestry) and the Congo Basin Forest Fund includes a specific objective to enhance local capacity for sustainable forest management.

The Darwin Initiative

The Darwin Initiative is a small grants programme that aims to promote biodiversity conservation and sustainable use of resources around the world. It seeks to share UK expertise and each application for funding support must have a UK and foreign partner organisation. The Initiative is funded and administered by Defra and has 8 objectives:

- To assist countries rich in biodiversity but poor in resources with the conservation of biological diversity and implementation of the CBD.
- To draw on British expertise in the field of biodiversity.
- Projects funded under the Initiative will be collaborative, involving either local institutions or communities in the host country.
- Projects will have a real impact on the ability of the host country to meet its obligations under the CBD.
- Projects will be of high quality and scientific (or other appropriate professional)

excellence.

- Whenever possible, Darwin funding will be used as a catalyst to lever additional funding for project work, which would not otherwise be forthcoming.
- The outputs and outcomes from projects should be additional to that from work being funded through other mainstream environmental or research programmes.
- Projects funded under the Initiative will demonstrate good value for money.

Since 1992, the initiative has:

- Committed £73m to 644 projects in 149 countries.
- Held seventeen rounds of competition.
- Involved over 200 British institutions.
- Partnered with 764 organisations in host nations.

Further information can be found via <http://www.darwin.gov.uk/>.

Expenditure on global biodiversity

Spending is one way of assessing the priority that is given to global biodiversity within the UK Government, and such funds are essential for the implementation of the CBD in developing countries. One of the UK Biodiversity Indicators considers UK Government funding for conservation of global biodiversity (<http://www.incc.gov.uk/page-3978>). Between 2000/01 and 2007/08 there was an 85% increase in real terms of UK funding for global biodiversity (during the same period there was a 19% increase in UK GDP). In 2007/08 UK funding for global biodiversity totalled £54 million. This increase was mainly driven by contributions to the Global Environment Facility and the Global Opportunities Fund.

Other expertise transfer

The UK is rich in institutional and individual expertise and experience. Amongst others, UK Universities, botanic gardens, museums and other genetic resources collection holders contribute to building capacity for Parties to understand biological diversity and implement conservation and sustainable use programmes. Funding for these programmes is derived from grants and awards (such as the Darwin Initiative), and through working in partnership with private industry.

Goal 3: National biodiversity strategies and action plans and the integration of biodiversity concerns into relevant sectors serve as an effective framework for the implementation of the objectives of the Convention

3.1 Every Party has effective national strategies, plans and programmes in place to provide a national framework for implementing the three objectives of the Convention and to set clear national priorities

Please see text in Chapter 2 of this report for information on the status of the UK's NBSAP.

3.2 Every Party to the Cartagena Protocol on Biosafety has a regulatory framework in place and functioning to implement the Protocol

The implementation of the Cartagena Protocol on Biosafety in the EC relies on a wide range of legislative measures applying to the use of genetically modified organisms (GMOs) within the European Union, including imports.

EC legislation on GMOs has been in place since the early 1990s. The EC introduced specific legislation on GMOs to protect its citizens' health and the environment while simultaneously creating a unified market for biotechnology products. Over the last decade the EC has created a comprehensive legal framework for ensuring safety in the development, use and transfer of GMOs. The main legal measures include:

- Directive 90/219/EC of 23 April 1990 on the contained use of genetically modified micro-organisms.
- Directive 98/81/EC of 26 October 1998 amending Directive 90/219/EEC on the contained use of genetically modified micro-organisms.
- Directive 2001/18/EC of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC, covering the field testing of GMOs (mainly Part B) and the placing on the market of GMOs as well as products containing or consisting of GMOs, e.g. for cultivation, import or processing into industrial products (mainly Part C). The Annex to this report lists further implementing measures relating to Part B and Part C of Directive 2001/18/EC.
- Regulation (EC) No 1946/2003 of 15 July 2003 on transboundary movements of genetically modified organisms covers exports of GMOs to third countries and unintentional movements of GMOs.
- Regulation (EC) No 1829/2003 of 22 September 2003 on genetically modified food and feed, covering the placing on the market of GMOs intended for food or feed and of food or feed products containing, consisting of or produced from GMOs.
- Regulation (EC) No 1830/2003 of 22 September 2003 concerning the traceability and labelling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms.
- Regulation (EC) No 641/2004 of 6 April 2004 on detailed rules for the implementation of Regulation (EC) No 1829/2003 as regards the application for the authorisation of new genetically modified food and feed, the notification of existing products and adventitious or technically unavoidable presence of genetically modified material which has benefited from a favourable risk evaluation.

The legislation is applied within the UK.

Details on the main elements of Directive 2001/18/EC and Regulations (EC) No's 1946/2003 and 1829/2003 are given under Article 2, 'General provisions', of the European Communities First Regular National Report on the Implementation of the Cartagena Protocol on Biosafety, available via

<http://www.cbd.int/biosafety/parties/national-reports.shtml>.

3.3 Biodiversity concerns are being integrated into relevant national sectoral and cross-sectoral plans, programmes and policies

Please see text in Chapter 3 of this report for information on work to mainstream biodiversity.

3.4 The priorities in national biodiversity strategies and action plans are being actively implemented, as a means to achieve national implementation of the Convention, and as a significant contribution towards the global biodiversity agenda

Please see text in Chapter 2 of this report for information on implementation of the UK Biodiversity Action Plan in a devolved manner.

Goal 4: There is a better understanding of the importance of biodiversity and of the Convention, and this has led to broader engagement across society in implementation

4.1 All Parties are implementing a communication, education, and public awareness strategy and promoting public participation in support of the Convention

Halting the loss of biodiversity has widespread public support within the UK. A great deal of biodiversity conservation is achieved by enthusiastic, passionate volunteers. One of the UK Biodiversity Indicators to measure progress towards the 2010 Target presents an index of the number of hours worked by volunteers in seven major UK conservation charities: Bat Conservation Trust, British Trust for Ornithology, Butterfly Conservation, Plantlife, Royal Society for the Protection of Birds (RSPB), the Wildlife Trusts, Woodland Trust, and a public body; Natural England. Volunteering activities include land management and public education by volunteer service wardens for RSPB and Wildlife Trusts, the number of people attending BTCV conservation tasks and the number of people taking part in bird surveys on a voluntary basis. Between 2000 and 2008 there was a 50 per cent increase in time spent volunteering, and in 2008 the total time spent was equivalent to around 750,000 working days, although this is only part of the total invested across the whole voluntary sector.

Audience research commissioned by the British Broadcasting Corporation suggests that 63% of adults in Great Britain are interested in nature and wildlife and that there are two key triggers for involvement: children and 'local patch'. Government and conservation NGOs have also commissioned studies on how best to engage people. The UK Biodiversity Partnership will share this information and experiences, once available, to maximise the effectiveness of its engagement. Key messages as to why we should conserve biodiversity will be tailored through communication strategies in each country of the UK and at regional and local levels. These will seek to both present the case for and value of biodiversity conservation and to encourage and aid behavioural change that will benefit biodiversity (in tandem with behaviours aimed at mitigating / adapting to climate change).

The UK Biodiversity Partnership believes that the following behaviours should be promoted, as they have a direct relevance on the conservation of biodiversity:

- Create, or encourage others to create, wildlife friendly spaces;
- Enjoy (and value) local wildlife friendly spaces and share this enjoyment with others;
- Support the work of wildlife conservation organisations;
- Think before you buy, for example wildlife-based products or souvenirs from overseas trips; buy wildlife / environmentally friendly / sustainably sourced products;
- Record what you see and send results to your Local Records Centre;
- Exercise your civic duties to ensure those that represent your views reflect your environmental concerns.

In addition to the opportunities provided by visiting nature reserves (which vary in scale from small fields to National Parks) and the wider countryside and landscape in which a major part of the UK population live, there are many in-situ biodiversity collections in the UK. Botanic gardens and open access plant collections for example, provide a great opportunity for public engagement, to inform the sectors of the public about international policy issues and how they relate to biodiversity and plants generally. For example, the Royal Botanic Gardens, Kew currently receives 1.9 million public visits per annum, where visitors can learn from interactive displays.

4.2 Every Party to the Cartagena Protocol on Biosafety is promoting and facilitating public awareness, education and participation in support of the Protocol

European Community legislation on GMOs promotes public awareness and participation as an integral part of its regulatory framework; this legislation applies to the UK.

Defra maintains a public register of all the GMOs which have been approved for use in the European Union under Directive 2001/18/EC and this is available for public scrutiny. In addition, Defra maintains a website which sets out the arrangements for public participation under the EU legislation on GMOs.

The UK is a party to the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental matters.

Further details are available under Article 23, 'Public Awareness and Participation', in both the UK's and European Communities First Regular National Reports on the Implementation of the Cartagena Protocol on Biosafety, available via <http://www.cbd.int/biosafety/parties/national-reports.shtml>.

4.3 Indigenous and local communities are effectively involved in implementation and in the processes of the Convention, at national, regional and international levels

Much work within the UK BAP is delivered in partnership, particularly through the

Local Biodiversity Action Plan (LBAP) mechanism whereby partners such as Local Authorities, Statutory Agencies and non-governmental organisations work together to identify and deliver local action for biodiversity - enhancing the quality and distinctiveness of local environments as well as contributing to achieving national targets. Currently there are around 190 LBAPs in the UK. These often, but not always, conform to county boundaries (<http://www.ukbap.org.uk/GenPageText.aspx?id=57>).

4.4 Key actors and stakeholders, including the private sector, are engaged in partnership to implement the Convention and are integrating biodiversity concerns into their relevant sectoral and cross-sectoral plans, programmes and policies

With the exception of the inclusion of the private sector this objective is repetitive of objective 3.3 (q.v.); The UK has therefore for this section provided details of the private sector only.

Private Sector

Defra, Natural England and the EarthWatch Institute maintain a website marketed as the 'one stop shop for information about business and biodiversity' <http://www.businessandbiodiversity.org>.

The website stresses that as biodiversity disappears so do opportunities for new products, new technologies and new business opportunities. Information is provided about the role biodiversity plays for businesses and the impacts different sectors have on wildlife and nature, split into: construction; oil and gas; finance; tourism; mining and quarrying; utilities; food and drink; pharmaceuticals; agriculture; and printing.

Further to providing advice to businesses on how to create effective Biodiversity Action Plans, at both company level and site level (for landowners) the website details more specific actions to compliment the plans, such as supply chain management, planting for biodiversity and stakeholder involvement. Ten indicators of biodiversity engagement have been provided as broad assessments of a company's commitment to biodiversity and the successful integration of biodiversity into its environment management system. These key features of good practice have been suggested after consultation with companies throughout the UK.

Examples of private sector consideration of biodiversity include:

Canary Wharf Group: <http://www.canarywharfenvironmentalandsocialreport.com/>

Biffa BAP: <http://www.biffa.co.uk/content.php?name=/cr/biodiversity/actionplan.html>

4.3 Conclusions

4.3.1 Introduction

The implementation of the CBD in the UK has been achieved through the UK Biodiversity Action Plan, first published in 1994. The UK Biodiversity Action Plan has undoubtedly improved conservation and sustainable use of biodiversity in a number of ways. Some of these are by:

- a. galvanising the entire biodiversity community, more than 1000 public, NGO and private organisations, through its partnership approach.
- b. raising awareness of biodiversity.
- c. focussing action on priorities.
- d. providing an overarching framework through which planning, implementation and the sharing of best practice can take place efficiently and effectively;
- e. embedding a target-based approach, which often goes beyond halting loss, to restoring biodiversity.

While there are still many challenges that need to be met in the UK and many individual species and particular habitats that continue to decline, the majority of biodiversity components have seen a decade or more of improvements in the UK after rather substantial losses in the 1970s and 1980s due, largely, to habitat loss caused by agricultural intensification practices (including the use of fertilisers and pesticides); increased land drainage; the channelization of water courses and eutrophication of waterbodies; the reduction in extent of hedgerows and loss of farm ponds; and the coniferisation of broadleaf woodlands - particularly in eastern and southern Britain. The improvements seen since the mid 1980s have been attributed to reduction in lowland habitat loss and measures to improve both water and air quality. A range of conservation-related measures introduced in the 1990s, of which the UK Biodiversity Action Plan is the most notable, have also helped, cumulatively, to stabilise, and in some areas increase, the biodiversity carrying-capacity of lowland Britain and to assist recovery for many of the most threatened habitats and species.

4.3.2 Access and Benefit Sharing

The UK remains committed to the Ninth Conference of Parties' decision to implement an international regime on access and benefit-sharing of genetic resources by the 10th Conference of Parties in 2010. Defra, supported by national experts and the regional working group at EU level have increased activity in order to help ensure that a decision by parties can be made in 2010.

4.3.3 UK BAP

Implementation of the UK Biodiversity Action Plan has been greatly assisted by the partnership approach to delivery, involving Governments, NGOs, the research community and the private sector. A targeted approach initially concentrating on

Carefully selected priorities has been successful in keeping delivery firmly focussed on positive outcomes for biodiversity. The preparation of Local Action Plans has also been extremely useful in reaching out to and involving local communities in delivering country, UK and even global objectives.

Despite these successes there is still much to do. It is expected that applying more of an ecosystem approach and more obviously dealing with social and economic aspects of biodiversity will help to engage other sectors and more elements of civil society to build on the progress made. Greater engagement across society on biodiversity issues will be essential to improving the support and capacity available for biodiversity work in the UK.

Reports on progress with the UK BAP action plans have been collated on a triennial basis since 1999. Results from the 2008 reporting round have informed the preparation of this report, in particular indicators 3 and 4 on the status of species and habitats (see chapter 1 for details). A 2008 Highlights report will be produced similar to the report done in 2005 <http://www.ukbap.org.uk/library/Reporting2005/UKBAPReport05.pdf>. This is planned for completion by early June for it to be signed off by the Ministers of the four countries prior to release in July / August 2009. The raw data, on which both the UK BAP trend indicators and the highlights report are based, can be accessed via the Biodiversity Action Reporting System <http://www.ukbap-reporting.org.uk/news/details.asp?X=55>.

The future UK approach to biodiversity action is summarised in the publication 'Conserving Biodiversity - the UK Approach' (<http://www.defra.gov.uk/wildlife-countryside/pdf/biodiversity/conbiouk-102007.pdf>).

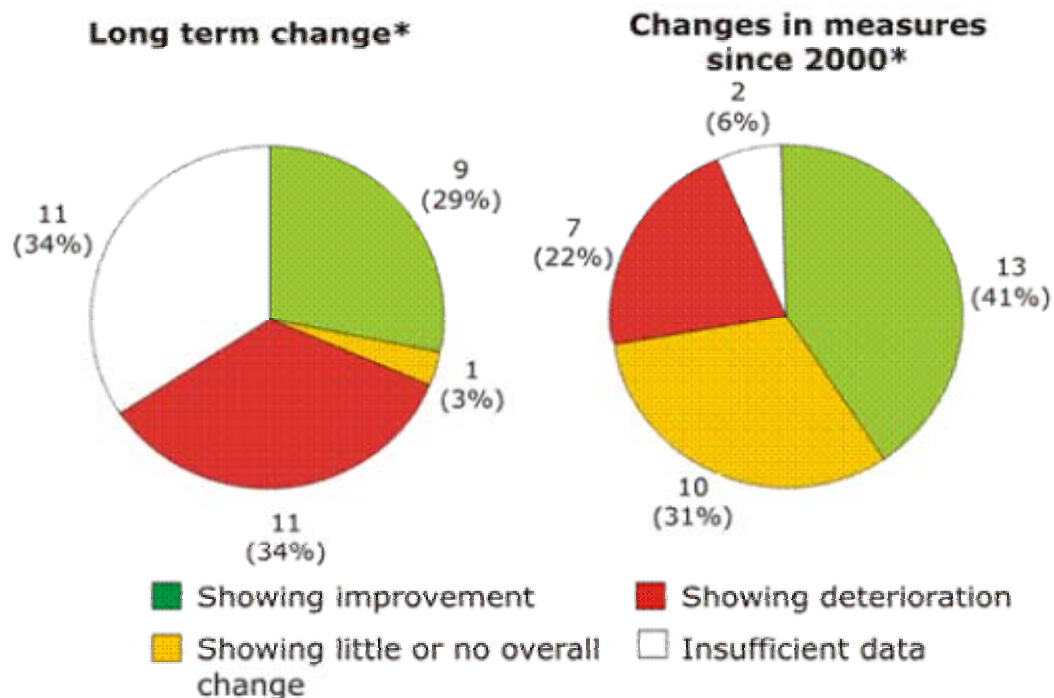
Future priorities for the UK are to maintain the momentum already established and to take a more holistic ecosystem approach to conservation and sustainable use of biodiversity. This will very much be led by the four devolved countries and is likely to increase efforts around working with other sectors, incorporating social and economic issues, taking a broader landscape or wider countryside perspective and trying to do more for the marine environment, including offshore waters (out to 200 nautical miles). This will be in addition to the more traditional work on the conservation of priority habitats and species, and protected areas. A National Ecosystem Assessment, based broadly on the UN's Millennium Ecosystem Assessment, is expected to be completed at the end of 2010. It will make a major contribution to embedding an ecosystem approach to policy and decision making. The first phase will be to join up the evidence base to provide a high level assessment of the status and trends of ecosystems and the services they deliver. The second phase will look at the future and how the ecosystems and services are likely to change.

Probably the greatest capacity building need for the UK is to raise awareness of biodiversity in non-environment sectors and with the general public, and in particular to increase understanding of the impacts of development activities on biodiversity and the role biodiversity plays in delivering environmental quality of life and key services, such as helping to address climate change issues, flood mitigation, air quality improvements, natural resources such as fish, timber, thatch, etc.

4.3.4 Meeting the 2010 Target

In 2002, the UN World Summit on Sustainable Development endorsed the target agreed five months earlier by the Parties to the Convention on Biological Diversity (CBD) 'to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth'. There is no single agreed measure of biodiversity loss but, within the CBD, Parties have decided to use a broad framework of goals, sub-targets and indicators relating to seven focal areas of the Convention to assess progress towards the 2010 target. Following this lead, the UK has developed a small set of indicators to measure our performance, in addition to the more specific targets agreed for priority species and habitats as part of the UK Biodiversity Action Plan. According to these indicators good progress has been to reduce the rate of biodiversity loss, with 13 (41%) out of 32 measures showing improvement since 2000. However, a further 10 (31%) measures show little or no overall change, and 7 (22%) measures show deterioration. The UK is on course to meet the 2010 target in some areas, not to meet it in some, and to exceed it in others, by not only reducing the current rate of biodiversity loss but reversing it.

The UK biodiversity indicators (www.jncc.gov.uk/biyp) are presented in Appendix 4, and used in section 4.1 to show progress against the global goals and targets agreed by the CBD. The pie charts below display the numbers of measures that have shown improvement (green traffic light), deterioration (red traffic light), little or no overall change (amber traffic light) or that have insufficient data for an assessment to be made (white traffic light). Assessments of change over the longer term and since 2000 are shown.



*Based on 32 measures, which make up 17 indicators (1 indicator is not assessed)

The assessments since 2000 generally show marked improvements compared with longer term (i.e. 10-30 year) trends where comparable data exist.

The indicators show positive outcomes for biodiversity in some areas, for example increases in populations of bats and other priority species, and plant diversity in arable fields. For other components of biodiversity such as woodland and water birds, butterflies and priority habitats, previous declines have been slowed or halted. However the indicators show continuing or accelerating declines in the populations of breeding farmland and seabirds, wintering waterbirds and plant diversity in woodland, grassland and field boundaries.

The indicators show that major efforts have been made to address the threats to biodiversity with more sustainable use of farmland, forestry and fisheries, controls on air pollution and improved water quality. However threats from invasive species have increased in marine and terrestrial ecosystems and climate change impacts on biodiversity are being observed.

The indicators show that specific actions to tackle biodiversity decline (i.e. responses) have increased, with strong positive trends in finance, volunteering and the extent of protected areas.

Each indicator has its own story. Some of the biological outcomes (e.g. populations of birds and butterflies) have been affected by a series of poor summers which have reversed previously improving trends. Other biological outcomes (e.g. plant diversity) are slow to respond and may take many years to show recovery. For some indicators (e.g. habitat connectivity and condition of protected sites) suitable methods and data are not yet available to make an assessment of the trend. These aspects need to be taken into account when drawing overall conclusions.

Taken together, we can conclude that the rapid declines in biodiversity in the UK during the last quarter of the 20th century have been substantially slowed and in some cases halted or reversed, and that efforts to address these declines through spending and public engagement have increased. Nevertheless, it is fair to say that there is a lot more to do.

The UK Biodiversity Action Plan has shown that actions can be very successful when resources are targeted at conserving particular species and habitats. Chapters 2 and 3 of this report provide information on how the UK has organised delivery of its NBSAP in a devolved manner, and examples of how work to embed consideration of biodiversity and ecosystem services is being taken forward through the biodiversity and environment strategies of each of the four countries of the UK.

In *Conserving Biodiversity – the UK approach*, the case for conserving biodiversity was set out:

- Because our survival depends on it;
- Because our economy and lifestyles depend on it;
- Because to do otherwise is wrong;
- Because it inspires and enriches our lives.

These messages remain true, and will help to guide future UK implementation of the UKBAP, and thereby of the CBD within the UK. Section 4.3.3 above gives some detail of how delivery of the BAP will continue in a devolved manner, and the increasing way in which this will involve working through other sectors.

4.3.5 Improving the Convention

The three aims of the Convention are as critical today as they were in 1992, but the understanding of the relationship between conservation, sustainable use and access and benefit sharing, and their significance for human well-being, has developed significantly and become more widely appreciated. The Convention, and the 2010 target in particular, have been a major motivation for Parties to develop their own policies, strategies and action plans to address these aims, building on the shared experience and guidance brought together in the Programmes of Work of the Convention. The Convention has also helped to mobilise civil society and improved channels for them to communicate with governments and work in partnership to deliver shared objectives. The Convention has provided a stimulus to scientific endeavour and a focus for capacity building and transfer of resources to developing countries.

Whilst there has been substantial progress since 1992 there remain some significant issues to be addressed:

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

The Convention has a very large scope and the issues it addresses are highly variable between different regions, consequently a large number of thematic and cross-cutting programmes of work have been initiated. These present the Parties and other users of the Convention with a flexible 'pick-and-mix' approach but there are areas of duplication between work programmes and limited resources are thinly stretched. The Parties need to agree on priorities which allow for a more concerted effort to make progress on the most important issues.

The ecosystem approach was adopted to underpin all activities of the Convention and yet its application in this way has been limited. It is generally seen as an adjunct to rather than a basis for all the activities under the Convention. To ensure the three aims of the Convention are met, taking into account not just environmental but also social and economic issues, the ecosystem approach needs to be more widely promoted as a framework that can underpin all activities. A substantial shift in mind-set across the Convention is needed. This will require a better understanding of how the ecosystem approach can be used by all programmes of work and cross-cutting issues. There is a need for clearer communication products and other tools such as mechanisms for better understanding ecosystem services and functions and how these can be valued by society.

In this respect the UK welcomes the study on The Economics of Environment and Biodiversity (TEEB) and would encourage the development of new mechanisms to support biodiversity building on this and similar valuation work.

The aims of the Convention must also be addressed through other international agreements and processes (including in particular the UNFCCC, UNCCD and WTO). In some cases decisions taken in these other fora can have far reaching consequences for biodiversity. More work is required to ensure that the Convention is appropriately acknowledged in other international agreements, that consistent and mutually-beneficial decisions are made, that duplication is avoided and that reporting obligations are coordinated.

A sound evidence base is fundamental to the efficient and effective implementation of the Convention. Without adequate understanding of the benefits provided by biodiversity, the threats to biodiversity and the possible solutions it is impossible to assess priorities and develop effective responses. A stronger and improved interface between science and policy is needed, including the means by which SBSTTA acquires and evaluates scientific findings, support for scientific capacity building, and assessments of status and trends in biodiversity and ecosystem services. However such scientific assessments should not be restricted in scope or influence to the Convention - they should inform other international agreements and thereby promote greater synergy between them.

The 2010 target of significantly reducing the current rate of biodiversity loss has proved extremely important in providing a political focus, engaging the public, and has led to increased action to conserve biodiversity. It is essential that there is a new target to take its place. The new target should have a timescale that ensures continued political focus so that the current momentum is not lost. The new target should engage the public and emphasise the link between biodiversity, ecosystem services and human health and well-being, and consumption of natural resources. The new target should be challenging but achievable and capable of assessment, building on work undertaken to assess the 2010 target at global, regional and national levels.

Appendix I - Information concerning reporting Party and preparation of national report

A. Reporting Party

Contracting Party	United Kingdom of Great Britain and Northern Ireland
NATIONAL FOCAL POINT	
Full name of the institution	Department of Environment, Food and Rural Affairs
Name and title of contact officer	Mr Eric Blencowe
Mailing address	Head, International Biodiversity Policy Unit Wildlife Habitats and Biodiversity Division DEFRA Room 1/10 Temple Quay House 2 The Square Bristol BS1 6EB UK
Telephone	(+44) 117 372 8295
Fax	(+44) 117 372 8373
E-mail	Eric.Blencowe@defra.gsi.gov.uk
CONTACT OFFICER FOR NATIONAL REPORT (IF DIFFERENT FROM ABOVE)	
Full name of the institution	
Name and title of contact officer	
Mailing address	
Telephone	
Fax	
E-mail	
SUBMISSION	
Signature of officer responsible for submitting national report	
Date of submission	

B. Process of preparation of national report

The UK commenced work on this report in 2007 as an input to the sample report process coordinated by the CBD Secretariat. The UK was invited to prepare a sample chapter IV, which was presented in a side event at CBD CoP in Bonn in May 2008. Subsequently, the UK has written the remaining text of the report and updated the sample chapter to become the formal submission to the CBD. As far as possible the UK has used or updated material which was already to-hand rather than creating analyses de-novo. A major part of the work has been to create and update a set of biodiversity indicators – these follow the flexible framework agreed in Decision VII.30. The indicators were first published in June 2007, and subsequently updated in May 2008 and April 2009 (see www.jncc.gov.uk/biyp for background behind the indicators, which are used in this report, especially in Chapter IV).

A wide variety of stakeholders have been involved, in both the governmental and non-governmental sectors, through the review of the initial draft of the report and by the sign-off process being through the UK Biodiversity Partnership Standing Committee (see <http://www.ukbap.org.uk/GenPageText.aspx?id=3> for information about the UK Biodiversity Partnership).

The process used for detailed development is given in the table below:

Date	Activity	Responsibility
Jun- Early Oct 08	Compilation of existing information, including Biodiversity In Your Pocket (BIYP) 08 indicators, into required format. First draft 4 th National Report (4NR).	Joint Nature Conservation Committee (JNCC)
Mid Oct- Nov 08	Initial review by UK Biodiversity Partnership Standing Committee. Consultation with Defra, Other Government Departments and Devolved Administrations. Provision of additional country-specific information, analysis and assessments.	UK Biodiversity Partnership Standing Committee (UKBPSC), Department for Energy, Food and Rural Affairs (Defra), Department for International Development (DfID), Foreign and Commonwealth Office (FCO), Forestry Commission (FC), Scottish Executive (SE), Welsh Assembly Government (WAG), Department Of Environment Northern Ireland (DOENI), country conservation agencies
Dec 08 – Jan 09	Preparation of second draft 4NR.	JNCC
Feb – Mar 09	Consultation with Defra, OGDs and Devolved Administrations.	JNCC Defra, DfID, FCO, FC, SE, WAG, DOENI
Apr 09	Publication and Incorporation of BIYP 09 indicators. Sign-off of 4NR by UKBPSC.	UKBPSC, Defra, SE, WAG, DOENI, JNCC
May 09	Sign-off by Ministers. Report production and publication. Submission to Convention on Biological Diversity Secretariat.	Defra

Appendix II : Further sources of information - key websites

NBSAPS

www.defra.gov.uk/wildlife-countryside/pdfs/biodiversity/ConBioUK-Oct2007.pdf

<http://www.defra.gov.uk/wildlife-countryside/pdf/biodiversity/biostrategy.pdf>

www.scotland.gov.uk/Resource/Doc/25954/0014583.pdf

<http://wales.gov.uk/topics/environmentcountryside/epq/envstratforwales/:jsessionid=vN4dJ6BLw6whqdhWdGmYnx2vZpbmNgyKT7y1nvhy1zMIjfGxrGk!2101391267?lang=en>

www.ehsni.gov.uk/nibs2002.pdf

Key sources of information

www.bto.org/birdtrends

www.businessandbiodiversity.org

www.butterfly-conservation.org/

www.cbd.int/biosafety/parties/national-reports.shtml

www.countrysidesurvey.org.uk/

www.darwin.gov.uk

www.dfid.gov.uk

www.forestry.gov.uk

www.incc.gov.uk/biyp

www.incc.gov.uk

www.nbn.org.uk/

www.ukbap.org.uk

www.ukcip.org.uk/

Appendix III

A. Progress towards Targets of the Global Strategy for Plant Conservation

In 2004 the United Kingdom of Great Britain and Northern Ireland developed 'Plant Diversity Challenge' as its response to the Global Strategy for Plant Conservation (GSPC). This adopted all 16 of the global targets within the 5 objectives of the GSPC. This report provides an overview of progress and key successes, obstacles encountered and the needs and future priorities identified towards meeting the targets. See 'Plant Diversity Challenge – 3 years - 16 targets - 1 challenge'²⁸ for more detail about the UK's progress in implementing the GSPC.

In addition to Plant Diversity Challenge, a strategy for the conservation of the UK's fungi *Saving the Forgotten Kingdom* was published in 2008 by the Fungus Conservation Forum²⁹. Plant Diversity Challenge and the UK Fungi Strategy are also supported by a 'Strategy for the conservation of lower plants and fungi in Scotland'³⁰ and 'A strategy and action plan for the conservation of lower plants and fungi in Wales'³¹.

OBJECTIVE 1: Understanding and Documenting Plant Diversity:

TARGET 1: A widely accessible working list of known plant species as a step towards a complete world flora.

UK botanical institutions are major contributors to global checklist data for Target 1 of the GSPC through working in partnership with non-UK botanical institutions. The CBD Secretariat has invited the UK's Royal Botanic Gardens, Kew to facilitate global progress towards Target 1. To date, one third of all accepted plant species are available as an online resource (www.kew.org/wcsp/). The Catalogue of Life programme is planned to become a comprehensive catalogue of all known species of organisms on Earth by the year 2011 – it is supported by many UK institutions and provides an online resource for global effort towards Target 1 (<http://www.catalogueoflife.org/>).

Checklists of UK plants (kingdom Plantae) and algae (kingdoms Plantae and Chromista) have long been complete and work is continuing to keep these lists up-to-date, accurate, and well-informed. 'The Checklist of British and Irish Vascular Plants and Stoneworts' is updated annually, and the 'Checklist of British and Irish Bryophytes' was updated in 2008. A revised edition of the 'Checklist and Atlas of the Seaweeds of Britain and Ireland' was published in 2006, and a second edition of the 'Coded List of Freshwater Algae of the British Isles' was produced in 2003. Checklists of UK fungi (kingdom Fungi) and fungus-like organisms (kingdoms Chromista and Protozoa) lag behind the algae and plants, but one major phylum (Basidiomycota) has now been covered. The publication of the Checklist of the British & Irish Basidiomycota is a major achievement, which will provide a sound foundation for the conservation of fungi. Checklists of lichenised fungi and lichenicolous fungi were updated in

²⁸ Plantlife International, Joint Nature Conservation Committee, Royal Botanic Gardens, Kew (2007) Plant Diversity Challenge: 3 Years – 16 Targets – 1 Challenge. Progress in the UK towards the Global Strategy for Plant Conservation. Joint Nature Conservation Committee, Peterborough, UK. <http://www.plantlife.org.uk/uk/plantlife-saving-species-global-strategy-pdcc2006.html>

²⁹ <http://www.plantlife.org.uk/portal/assets/News%20Sue%20Nottingham/Saving%20the%20forgotten%20kingdom%20PDF.pdf>

³⁰ Long D. and Ward, S. 2005. *Strategy for the conservation of lower plants and fungi in Scotland*. Plantlife International, Salisbury

³¹ Woods, R.G. 2009. *A strategy and action plan for the conservation of lower plants and fungi in Wales*. Plantlife International, Salisbury

2002 and 2003 respectively. The new checklists of seaweed, freshwater algae, lichenised fungi, and lichenicolous fungi have been added to the National Biodiversity Network (NBN) Species dictionary (<http://nbn.nhm.ac.uk/nhm/>). Key challenges for the future include creating a checklist for the British & Irish Ascomycota (kingdom Fungi), to include both sexual and anamorphic states, and creating checklists for the remaining UK fungal phyla (Chytridiomycota, Glomeromycota, and Zygomycota). A constraint to achieving Target 1 is the availability of trained, taxonomic mycologists. See Target 15 for how this constraint is being addressed.

TARGET 2: A preliminary assessment of the conservation status of all known plant species at national, regional and international levels.

Most assessment of plant conservation status has taken place at a Great Britain (England, Scotland and Wales) or 'Ireland' level. Work has continued with the Species Status Assessment project in order to provide a preliminary assessment of the conservation status of UK plant species using IUCN criteria. Assessment has been completed for GB vascular plants (published 2005), GB bryophytes (2005 – partial revision published), and GB charophytes, and work is ongoing for lichens (Lichen Ireland recoding project initiated), marine algae and desmids, bryophytes and fungi. The Ireland Bryophyte Red list is in its final draft form, and a new bryophyte atlas project for the British Isles has been initiated. In Wales, country-wide assessments have been published for vascular plants (2008)³² and are underway for lichens. Two particular successes stand out for this target. Firstly, the preliminary assessment of seaweeds and desmids. IUCN have recently been promoting the idea of preliminary assessments rather than full assessments, as the only way that the target can be achieved globally. Importantly, the work done on seaweeds and desmids has already been used in Target 5 implementation (identifying areas important for plant diversity). Secondly, a full assessment of all GB vascular plants has been published for the first time. This was made possible by the formation of a project working group with representation from all interested major organisations. This project has also contributed to Target 16 (networking), and Target 14 (communicating and educating) as the publication was a notable media success. The greatest challenge is now to improve understanding of UK flora in an international context, which will require partnerships with botanists in other countries. Improving data accessibility and centralization is also an important priority for the future. It may also be possible to accelerate assessment throughout Europe if data provision to the Global Biodiversity Information Facility (GBIF) is adequately provided for. This would be likely to offer high value for money, since both the data and mechanisms for centralization (NBN Gateway, and GBIF) already exist. In addition, at an international level, the plant component of the IUCN Sampled Red List Index is coordinated by the Royal Botanic Gardens, Kew. The project involves a preliminary GIS-based conservation assessment for 1,500 randomly selected species including bryophytes, ferns, monocots and dicots, plus an assessment of all gymnosperm species. The aim of this project is to produce a representative assessment of the global status of biodiversity, and to highlight taxa of particular concern.

TARGET 3: Providing methods for plant conservation based on best practice.

For Target 3 a technical review was undertaken for the CBD, looking at 'the development of models with protocols for plant conservation and sustainable use, based on research and practical experience' (<http://www.biodiv.org/doc/meetings/cop/cop-06/official/cop-06-12-add4->

³²

<http://www.plantlife.org.uk/uk/assets/saving-species/saving-species-publications/A%20Vascular%20Plant%20Red%20Data%20List%20for%20Wales.pdf>

[en.pdf](#)). This review provided a series of key areas in which the development of models with protocols was required. These were: integration of *in-situ* and *ex-situ* conservation; maintenance of threatened plants within ecosystems; applying the ecosystem approach; balancing sustainable use with conservation; methodologies for setting conservation priorities; and methodologies for monitoring conservation and sustainable use activities. Progress has been made in most of these areas, but the lack of discrete, clearly defined targets (at least in part due to its cross-cutting nature) makes progress more difficult to assess for this target than for others. Some specific examples of actions taken are listed below:

- The Ecosystem Approach Sourcebook website (<http://www.biodiv.org/programmes/cross-cutting/ecosystem/sourcebook/home.shtml>), was created by the Joint Nature Conservation Committee to help practitioners implement the ecosystem approach and share experiences;
- The UK Biodiversity Research Advisory Group (BRAG) was formed to provide advice to biodiversity research funding bodies, research users and research institutions about biodiversity research priorities and co-ordination in the UK;
- The website <http://www.conservationevidence.com/> was created to provide access to a wide range of case studies relating to conservation activities and their consequences;
- Online dossiers for vascular plants, bryophytes and lichens have been produced by Plantlife to inform and aid management <http://www.plantlife.org.uk/uk/plantlife-saving-species-dossier.html>;
- A workshop at Kew on conservation genetics led to the 'Proceedings of a conservation genetics workshop' (2004). English Nature Research Report 607; ISSN 0967-876X;
- A review has been undertaken of how genetics is used in conservation of British flora. During production of the review, a web-based database of genetic studies was developed. See <http://rbg-web2.rbge.org.uk/pcwg/Database.htm>;
- Two books have been published on seed biology relating to conservation methodology: Seed conservation: turning science into practice (2003; ISBN 1 84246 052 8, RBG Kew) and Growing orchids from seed (2005; ISBN 1 84246 091 9, RBG Kew).

OBJECTIVE 2: Conserving Plant Diversity:

TARGET 4: At least ten per cent of the world's ecological regions effectively conserved.

Target 4 is fully integrated into the implementation of general CBD goals and targets, and will not be considered further here.

UK botanical institutions work in partnership with other governments and international botanical institutions towards improved conservation of the world's ecological regions. For example, a Darwin Initiative funded project is being followed up with future conservation of drylands in the Central Andean Valleys of Bolivia, promoting long term conservation in four key areas with high tourist potential (www.kew.org/scihort/tropamerica).

TARGET 5: Protection of 50 per cent of the most important areas for plant diversity assured.

There has been considerable progress with the implementation of Target 5 since the third CBD national report. An inventory of 150 UK Important Plant Areas (IPAs) was published in 2007,

taking into account the reports on Important Stonewort Areas (2004, <http://www.plantlife.org.uk/uk/assets/saving-species/saving-species-publications/Important-Stonewort-Areas-summary.pdf>) and Important Arable Plant Areas (2005, <http://www.plantlife.org.uk/uk/assets/saving-species/saving-species-publications/Important-Arable-Plant-%20Areas.pdf>). Further work to develop IPAs includes a list of site for Algae published in 2008, and a list for Lichens which is in press. One obstacle encountered in the selection of IPAs has been that the European status of many vascular plants and lichens is not currently known. Developing a European Red list or similar assessment of international importance for vascular plants and updating the provisional list for lichens would be useful to aid IPA selection. Other actions taken have included: developing methodologies for the monitoring of plant features on UK SACs, SSSIs and ASSIs (first synthesis report published in 2006), completion of the Review of Marine Nature Conservation (Published by Defra in 2005) and holding a workshop (February 2006) to refine understanding of effective conservation and favourable condition as a part of work on the Habitats Directive and Country Agency Common Standards Monitoring project.

Many IPAs overlap with A/SSSIs, however initial results from Common Standards Monitoring of A/SSSIs indicate that only approximately 50% of plant features are currently 'favourable'. Further analysis is required to determine the true extent of botanical features listed notified within the protected site system. Progress is being made to increase the percentage of plant features in favourable condition, yet there is still some way to go before their protection is assured

Key priorities identified for the future include: targeting uptake of agri-environment schemes to support IPA protection and management; determining whether additional means of protection are necessary to support the conservation of nationally important marine species and areas (in light of the Irish Sea Pilot recommendations); using the UK IPA inventory to inform landscape-scale conservation projects, and working with landowners to deliver positive management for IPAs. Where IPAs overlap with A/SSSIs, it is essential to ensure the botanical/mycological interest is fully covered in the site management statement.

Breakdown of UK IPAs by taxon group (note the total number exceeds 150 as IPAs can have multiple qualifying features):

Type of qualifying feature	Number of IPAs
Vascular plants	78
Lichens	53
Bryophytes	48
Stoneworts	27
Marine algae	9
Desmids	3
Freshwater algae	3

TARGET 6: At least 30 percent of production lands managed consistent with the conservation of plant biodiversity

The UK is currently on target for 30% of its production lands being managed consistently with the conservation of plant biodiversity by 2010. There are a range of incentive schemes that

provide payment for environmental management of production lands. Up to the end of 2004 in England, approximately 18% of the total production area was managed either under the Agri-environment (AE) scheme, Wildlife Enhancement Scheme (WES), Woodland Grant Schemes or was under direct Forestry Commission management, and in Wales, the figure was higher, at over 36%. Between 15% and 46% of this land is semi-natural habitat and is therefore likely to be under management consistent with the conservation of plants with a restricted distribution. In England, the percentage of land in schemes has been rising rapidly with the introduction of the Entry Level Environmental Stewardship Scheme in 2005. The re-structuring of agri-environment schemes in 2005 has also introduced higher level schemes, having more explicit links with environmental outcomes (such as habitat re-creation or plant conservation, including of Biodiversity Action Plan (BAP) priority species) and being more targeted to features of high environmental value or potential. A study by Walker *et al* (2006)³³ has shown the effectiveness of the new schemes in plant conservation. The re-structuring of the forestry schemes (in 2005) has enabled improved targeting and reporting of national and local biodiversity targets. Other actions taken to help achieve this target have included the re-establishment of the England Biodiversity Strategy Agricultural Workstream Group in January 2006; establishment of the Arable Plants Project (a partnership between Plantlife and the Farming and Wildlife Advisory Group); and the production of guidance on managing production land. The Rural Development Service and CCW have produced a series of Illustrated Guides and Technical Advice Notes available to those in the AE agreement. The arable plants field guide has been published (2003, ISBN 1-903657-02-4, EN/Wildguides), and English Nature (now Natural England) and the RSPB have also published a series of handbooks.

In Wales, the ability of the higher level scheme (Tir Gofal) to deliver the needs of priority species was examined by Morris *et al.*, (2008)³⁴. This reported mixed results, with some species (such as those of heathland) being well catered for, but others (such as arable plants and waxcap fungi) suffering from a limited prescription area, damaging prescriptions and poor targeting. There are, for example, just 3,033 ha of land under the best prescription for arable plants (uncropped fallow margins). A monitoring project is now underway to assess the impact of prescriptions on populations of priority species on farms.

In Scotland, the Rural Development Programme was launched in 2008. As the name suggests, this scheme has a much broader remit than just agri-environment, but it does include a range of biodiversity prescriptions.

One constraint has been the general paucity of information on distribution and management requirements for fungi, bryophytes and stoneworts. Further research into their habitats is needed to ensure actions for appropriate management are built into the incentive schemes. Success of the incentive schemes, particularly the higher-level agri-environment tiers requires careful targeting to areas of known value or potential. There is therefore a requirement for access to data with sufficient precision to allow individual fields to be identified without compromising the conservation of the plant itself. The NBN and initiatives such as the UK Important Arable Plant Areas project are extremely valuable, providing information for farmers, landowners and policy makers. Finally, there is a need to develop a clearer understanding of the contribution of the incentive schemes to the conservation of uncommon plants, and to UK HAP and SAP targets. Data from the Countryside Survey (2007) is likely to be useful in evaluating this, although more

³³ Walker K, Critchley C N R, Sherwood A J, Large R, Nuttall P, Hulmes S, Rose R, Moy I, Towers J, Hadden R, Larbalestier J, Smith A, Mountfield J O and Fowbert J A. 2006. *Effectiveness of new agri-environment schemes in conserving arable plants in intensively managed landscapes*. Centre for Ecology and Hydrology and ADAS report for Defra

³⁴ Morris A.J., Smart J., Lamacraft D., Bialynicki-Birula, N., Luxton K-J. , Haysom K., Rasey A., Williams C., Hobson R., Dines, T., Parry R.J., Wilberforce E.M., Chapman, C. 2008. Potential for biodiversity delivery by Welsh agri-environment schemes. Report to WAG. RSPB: Cardiff.

significant will be detailed monitoring schemes such as the project initiated in 2009 to assess the effectiveness of Tir Gofal in conserving Welsh priority species.

TARGET 7: 60 per cent of the world's threatened species conserved *in-situ*.

The UK BAP is one of the main ways in which the UK implements Target 7. In 2005, UK BAP Lead Partners reported on progress, as well as reviewing targets and action plans. A major recent success in the UK BAP was the review of species to produce the new 'UK List of Priority Species and Habitats' which was presented in a UK BAP website report in June 2007, and has now been formally adopted by the UK government and all four UK administrations. Half of all UK BAP Priority Species are plants and fungi (556 out of 1,150). Local Biodiversity Partnerships are a further key component of the UKBAP. England, Wales and Scotland have published lists of species of principle importance for biodiversity conservation in response to the NERC Act 2006, Sections 41 and 42, and the Nature Conservation (Scotland) Act 2004, Section 2. Northern Ireland, Scotland, Wales and England have all published Country Biodiversity Strategies, stating specific targets, many of which refer to *in-situ* conservation of plants.

Many tools have been created to support the *in-situ* conservation of plants. The NBN Gateway provides an effective mechanism for the sharing of biological records. The country agencies all have a range of plant-specific management handbooks, reports and leaflets available. The Plantlife website currently holds species dossiers <http://www.plantlife.org.uk/uk/plantlife-saving-species-dossier.html> providing detailed ecological and conservation management information for 43 species of plants and fungi, with an additional 23 Species Briefing Sheet advice leaflets available.

The initiation of Common Standards Monitoring on protected areas is allowing, for the first time, a measure of how well areas are performing for plant conservation, information which should feed into management plans to bring plant features into 'favourable condition'. Implementation of Common Standards Monitoring for vascular plants, bryophytes and lichens is still at an early stage, but initial results suggest that about 50% of plant features are in favourable condition. A key priority for the future is to improve plant monitoring coordination through UKBAP, and data availability. The goals for threatened species need to be clearly set out, so that protected areas are managed appropriately for all of the threatened species and habitats present upon them, through effective communication of those requirements to conservation officers and land managers.

TARGET 8: 60 per cent of threatened plant species in accessible *ex-situ* collections, preferably in the country of origin, and 10 per cent of them included in recovery and restoration programmes.

The UK has made considerable progress towards *ex-situ* conservation, although more work is needed in promoting recovery and restoration programmes. Around 96% of UK seed-bearing species are represented in RBG Kew's Millennium Seed Bank, most of the remainder either do not produce seed or produce seed which is not storable under conventional conditions. 92% of vascular plant species regarded as Critically Endangered are currently represented, but of these only lady's slipper orchid (*Cypripedium calceolus*) and starfruit (*Damasonium alisma*) have been the subject of any kind of reintroduction work during the reporting period. Interrupted brome (*Bromus interruptus*), formerly extinct in the wild, was successfully reintroduced to sites in Oxfordshire and Cambridgeshire in 2003 and 2004. Progress has also been made in developing methodologies for the *ex-situ* conservation and reintroduction of bryophytes. Since 2003, 12 threatened species have been incorporated into the *ex-situ* bryophyte tissue culture collection

and 8 species have been incorporated into the cryopreserved collection. Novel methods for the weaning of cryopreserved bryophyte material onto sandstone and its subsequent introduction to natural sites have been developed. The UK National Culture Collections (UKNCC) has continued to develop and manage its collections of microbial and cell line genetic resources which have current or potential use, recently producing on-line catalogue databases. PlantNetwork, as part of their *ex-situ* cultivation project, have undertaken a survey of threatened vascular plants held in living collections in the UK. This is part of a detailed response by PlantNetwork to achieving Target 8 through their member gardens (see: <http://www.plantnetwork.org/projects/nbgtarget8.pdf>). The Royal Botanic Gardens Edinburgh (RBGE) is developing a spore storage facility, and a major Pteridophyte re-introduction programme is focusing on the UK BAP species, oblong woodsia (*Woodsia ilvensis*). Key future priorities are to raise the profile of *ex-situ* conservation work on groups such as lichens, microfungi, algae, and to catalyse the *in-situ* use of the existing collections (mainly higher plants and bryophytes) through reintroduction and recovery programmes.

TARGET 9: 70 per cent of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated local and indigenous knowledge maintained.

In 2004 Defra commissioned the development of a 'UK National Inventory of Genetic Resources for Food and Agriculture' from the University of Birmingham, which focused on collating information on UK landraces and crop wild relatives (CWR) diversity. The [report](#) was published in mid 2005. The project collated important baseline information in a database structure and focused specifically on the following:

- collating data and assess the UK *in situ* distribution of CWR and identify priorities for conservation action;
- identifying the five existing UK protected areas with the highest concentration of complementary CWR taxa and therefore identify suitable locations for the establishment of CWR genetic reserves;
- undertaking IUCN Red List threat assessment for UK CWR taxa;
- preparing CWR Conservation Action Plans for priority UK CWR taxa;
- collating data and assessing the diversity of UK under-utilised wild harvest species, by linking to the existing 'Wild Harvest' database hosted by the Economic Botany Section at the Royal Botanic Garden Kew;
- collating and assessing UK obsolete cultivars and breeding stocks in *ex situ* collection;
- collating and assess current extant UK landraces and primitive forms.

Information on these points can be found in the new Defra GRFA (genetic resources for food and agriculture) web site (<http://grfa.org.uk/index.html>).

The 'UK National Inventory of Genetic Resources for Food and Agriculture' concluded that the UK possesses significant genetic resources of importance for food and agriculture but this diversity is under threat and, particularly in terms of landrace diversity, little is known of the actual diversity present in the UK. The findings and recommendations of the report have been discussed by the UK Plant Genetic Resources Group (UKPGRG) which has helped in setting key priorities for further action and funding. Recording the landrace diversity of fruits, root crops and vegetables, not covered within the timeframe of the initial inventory project, are seen as a priority by the UKPGRG as a major contribution to Target 9 of Plant Diversity Challenge.

In addition, the UK contributes to international efforts to conserve plant diversity through its support to the Global Crop Diversity Trust.

TARGET 10: Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems.

Implementation of this target is fully integrated into the UK response to the CBD Cross-Cutting Issue on Invasive Alien Species.

OBJECTIVE 3: Using Plant Diversity Sustainably:

TARGET 11: No species of wild flora endangered by international trade.

The UK's flora is not at threat from international trade. Very little international trade of UK species takes place, and there is no evidence of populations being threatened by any international trade that does take place. Monitoring of species is taking place to ensure the situation does not change. Internationally, the key challenge is for the UK is to support biodiversity-rich countries in their bid to fulfil Target 11 by 2010. Supporting the Convention on Trade in Endangered Species (CITES) in capacity building in key exporting countries and UK and EU enforcement will enable Target 11 to be met on a global scale. The UK has supported the listing of Brazilian Mahogany (*Swietenia macrophylla*) and Ramin (*Gonystylus bancanus*) on Appendix II of CITES and worked with its range States to assist in the implementation of these listings. The UK has also been a key player in the European Union FLEGT (Forest Law Enforcement, Governance and Trade) process in which the EU is seeking mechanisms to secure access to legal and sustainable timber supplies. As the UK CITES Scientific Authority for plants, The Royal Botanic Gardens, Kew is leading on work to use the UK's science base and enforcement experience to develop forensic tests that could be used, for example, to identify CITES timbers in trade and for sustainable harvesting for CITES listed species.

TARGET 12: 30 per cent of plant-based products derived from sources that are sustainably managed.

Target 12 has been addressed by developing and implementing many mechanisms to encourage sustainable production. These range from regulations to voluntary schemes and include the following:

- Biodiversity Strategies in England and Scotland acting through the UK Biodiversity Partnership;
- Sustainable Development Strategies in England, Scotland and Wales and at UK level;
- Sectoral plans, e.g. UK Forestry Standard, country forestry strategies, Organic Action Plans;
- Voluntary schemes such as the Good Bulb Guide and SoundWood Guide (<http://www.globaltrees.org/soundwood.htm>);
- Schemes demonstrating best practice for example, by LEAF (Linking Environment & Farming);
- Chain of custody and origin identification, e.g. voluntary schemes and FSC chain of custody policies;

- Cross-compliance under the single farm payments scheme – including boundary maintenance, maintaining levels of permanent pasture, and reducing overgrazing;
- Environmental Entry and Higher Stewardship schemes for farmers in England which can be used to deliver simple and more complicated environmental management including organic production systems;
- The EU Rural Development Regulation, which allows for payments to benefit Natura 2000 sites and forestry management needs;
- Regulations - such as the requirements of the EU Nitrates and Environmental Impact Assessment Directives.

Creating markets for sustainable products is essential for producers. There has been increasing public recognition of the impact of production methods on the environment and the people who grow and harvest them. Businesses are promoting Fairtrade products such as coffee and bananas. Target 12 requires that imported plant-based products should be sourced from sustainably managed systems. Some key commodities imported into the UK have a significant biodiversity impact in the country of origin, for example soya and biofuels. The Joint Nature Conservation Committee is piloting a Global Impacts Study to assess the impact of UK imports on biodiversity globally (<http://www.jncc.gov.uk/page-4354>). The outcomes of the project will seek to establish mechanisms for reducing the environmental impact of plant production methods in the countries concerned and seek ways to reduce the UK's global environmental footprint.

TARGET 13: The decline of plant resources, and associated indigenous and local knowledge innovations and practices that support sustainable livelihoods, local food security and health care, halted.

Throughout Britain there are many regional projects that involve collating information about the traditional uses of plants. The information gathered reflects the use of plants in the last century for making dyes, traditional food and drink recipes, medicines, cosmetics, fodder and building material. A range of books have been published that provide information about the current uses of UK species and also link traditional and current use (Milliken & Ridgewater, 2005³⁵, Prendergast & Sanderson, 2005³⁶). Of the 2,000 species 'recorded' as British, information has been gathered on over 1,000 species and about 300 of these species are currently being harvested.

Although there is an increase in the diversity and volume of plant-derived products entering the trade in Britain that contain British species, most of these products are being supplied from plants grown abroad. If the use of many British species increases then mechanisms need to be in place to monitor the amount harvested from the wild to check it is sustainable, and support would need to be given to cultivate more material either traditionally or using modern techniques such as hydroponics.

The LINK programme between Defra and the Biotechnology and Biological Sciences Research Council has provided financial support to a few projects that are looking at the commercial potential of developing British species for use as non-food crops. More could be made of many species growing in Britain such as bearberry (*Arctostaphylos uva-ursi*), sundew (*Drosera* spp), bogbean (*Menyanthes trifoliata*), bog myrtle (*Myrica gale*), dock (*Rumex* spp), herb robert

³⁵ Milliken, W. & Bridgewater, S., 2005, *Flora Celtica*, Birlinn

³⁶ Prendergast, H.D.V. & Sanderson, H., 2005, *Britain's wild harvest*, Compass Press Ltd

(*Geranium robertianum*), marshmallow (*Althea officinalis*), nettles (*Urtica* spp) and yarrow (*Achillea millefolium*).

Although significant progress is being made in halting the loss of traditional knowledge about British species it has been difficult to obtain accurate information about the volume of material being harvested. This information along with more data about the number of people involved in harvesting and making some income from the development of these plant-based products would enable this target to be met.

OBJECTIVE 4: Promoting Education and Awareness about Plant Diversity:

TARGET 14: The importance of plant diversity and the need for its conservation incorporated into communication, educational and public awareness programmes.

In May 2006, a UK national workshop was held at the RBGE to: increase awareness of Target 14 and the GSPC; examine the status of plant based education in the UK and identify gaps; encourage the involvement of stakeholders in delivering plant based education; share best practice; recommend a series of actions for taking forward Target 14; and propose a series of indicators for Target 14's success and progress.

Although there is no explicit mention in the National Curriculum in England of teaching pupils about the importance of plant diversity and its conservation, teaching about plants is included, and in 2005 the House of Commons Education and Skills Committee published a report on education outside the classroom. As a result of the report, a manifesto was proposed for the new school year (September 2005), setting out a commitment that all children should benefit from a wide range of high quality outdoor learning. The Field Studies Council Outdoor Classroom introduces over 25,000 students per year onto Biology and Ecology courses, which is likely to promote awareness of plant diversity and conservation amongst participants.

Throughout the UK there are a wide range of organisations that provide informal plant-based education. Some examples include botanic gardens, zoos, the National Trust, the Royal Society for the Protection of Birds, the Black Environment Network, the Natural History Museum (NHM), British Trust for Conservation Volunteers, and Landlife. In 1998 Landlife founded the National Wildflower Centre, and in 2005, established the Wildflower Heroes project. This 3 year project helped to raise plant awareness and engaged with people from a wide range of backgrounds. The project involved informal workshops and formal education events and undertook activities with 13,780 individuals.

Communication and awareness about biodiversity are major components of Local Biodiversity Action Plans and a great deal of progress has been made in this area. However, more needs to be done to raise awareness of both the GSPC (and its aims) and plant conservation amongst policymakers so that there is greater synergy between the UK plant strategy and policy instruments.

OBJECTIVE 5: Building Capacity for the Conservation of Plant Diversity:

TARGET 15: The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this strategy.

One of the priorities identified in the 2004 Plant Diversity Challenge was to promote training in whole plant biology and identification at all levels. The UK Taxonomic Needs Assessment carried out by the Natural History Museum in 2004 revealed that a lack of specialised taxonomic identification services in the UK is adversely affecting biodiversity conservation. The UK is also suffering from low levels of recruitment of specialists, and the lack of field guides for some areas. Advances in achieving this target are being made, and will help ensure efficient, accurate delivery of conservation action.

Mentoring is one approach that has been used, where success is largely reliant upon the transfer of knowledge from an existing 'expert' source. The British Lichen Society apprenticeship scheme has proved extremely successful in Scotland, and the Royal Botanic Garden Edinburgh are funding a permanent lichen post. This forward looking approach can be viewed as a form of 'institutional mentoring' whereby a new appointment is made to 'run in tandem' a number of years before another staff member is due to retire. It is particularly important where the staff member is only one of a handful of individuals employed in the UK with a particular expertise. The NHM has also recognised that they will soon be facing a similar situation and have developed a succession planning strategy to ensure continuity of specialist knowledge. BTCV are running Natural Talent apprenticeship schemes (2008) for Mycology, Bryology, and Lichenology.

The University of Birmingham School of Biosciences in collaboration with a number of partner organisations has made substantial progress towards this target by providing formal training programmes. They now run a training and professional development programme including several courses leading to qualifications in plant identification and recording, for example, the Certificate in Biological Recording and Species Identification, MSc Biological Recording, and Identification Qualifications in Vascular Plants, Aquatic Macrophytes, Bryophytes and Freshwater Algae (with the Field Studies Council (FSC) and the NHM). The FSC are leaders in the field of leisure learning, running around 120 botanically focused courses per year, catering for an estimated 1,500 students. A new initiative, Training the Botanical Trainers, has also been developed by the FSC and the Botanical Society of the British Isles (BSBI), aiming to improve effectiveness of such courses.

Many organisations are working at different levels to promote recruitment in plant conservation and the necessary training. The FSC promotes out-of-classroom activity and identification skills as part of the school curriculum; the 'Science and Plants for Schools' project works with teachers and students to develop new resources and encourage careers in plant science; a 'Lantra Heritage and Botanic' report, published in 2005, maps careers, occupations and skills required for the maintenance of botanic and historic gardens; and a partnership including PlantNetwork, RBGE and RBG Kew, has been established to address the sector's skills problems, particularly the delivery of training.

Target 16: Networks for plant conservation activities established or strengthened at international, regional and national levels.

Both the publication of Plant Diversity Challenge in 2004 and the preceding meeting in 2003 facilitated networking and strengthened resolve, bringing together people from a range of organisations and providing a focus for people and groups to work in partnership on individual targets.

While there are of course many informal linkages through individuals a number of more formal networks also exist, for example:

- PlantNetwork (www.plantnetwork.org) is a network of UK gardens and plant collection holders to promote the use of plant collections in Britain and Ireland and for the education of the public.
- The Global Partnership for Plant Conservation (GPPC) is a network to support global implementation of the GSPC. Many UK institutions are active members of GPPC. See www.plants2010.org for more info.
- The European Native Seed Conservation Network (ENSCONET) coordinates seed conservation of native plants within Europe. The network involves 24 partner institutions from 17 countries. This project has received funding from the European Commission's Sixth Framework Programme for Research and Technological Development. See www.ensconet.com/ for more info.
- Plant Link UK brings together specialists and practitioners of plant conservation from approximately 50 organisations to work in partnership and co-ordinate action that contributes towards Plant Diversity Challenge. Plant Link Scotland, Plant Link Cymru and Plant Link England provide similar roles in their respective countries, allowing Plant Link UK to take a broader overview of UK issues. Plantlife International provides the secretariat for all Plant Link fora.

B: Progress towards Targets of the Programme of Work on Protected Areas

The UK completed a CBD thematic report on protected areas in 2003 (<http://www.cbd.int/doc/world/gb/gb-nr-pa-en.doc>). The majority of the information in the report is still valid, although, as would be expected with the passage of time, further work has been undertaken. Table 6 gives an overview of the number of protected areas in the UK and one of the UK biodiversity indicators (<http://www.incc.gov.uk/page-4241>) provides detail of the total area and status of a subset of the sites.

Table 6: Numbers and areas of UK protected sites as at 31 March 2008

Designation	Number of Sites	Area (ha)
Special Protection Areas	253	1,584,253.78
Special Areas of Conservation	614	2,630,839.76
Ramsar	146	782,727
Sites of Special Scientific Interest	6,567	2,317,837.62
Areas of Special Scientific Interest	256	94,170.73
SSSI + ASSI	6,823	2,412,008.35
Marine Nature Reserves	3	20,862.14
National Nature Reserves	401	261,638.84
Local Nature Reserves	1,448	50,642.74
Areas of Outstanding Natural Beauty	50	2,470,274.74
National Scenic Areas	40	1,378,358
National Parks	14	2,039,483.9
Heritage Coasts	46	1,603 km

Note: Figures exclude sites in the UK Overseas Territories and Crown Dependencies.

Goals	Target	UK implementation
<p>1.1. To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals.</p>	<p>By 2010, terrestrially ^{37/} and 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010; (ii) the Millennium Development Goals – particularly goal 7 on ensuring environmental sustainability; and (iii) the Global Strategy for Plant Conservation</p>	<p>About 2.4 million hectares (approximately 10% of the UK’s terrestrial area) is protected by national site designations – known as Sites of Special Scientific Interest (Areas of Special Scientific Interest in Northern Ireland). These sites may be designated for biological and/or geological/geomorphological reasons. They underpin most international designations and are subject to the relevant additional management and protection provisions. The SSSI designation is restricted to above mean low water level, but many of the coastal sites designated as international sites (under the Ramsar Convention, or the EU Birds and Habitats Directives) also encompass subtidal inshore elements, protecting a further million hectares.</p> <p>As at January 2009, there are 156 Marine Protected Areas in UK waters consisting of Special Areas of Conservation (SAC) and Special Protection Areas with marine components as well as the 5 recently proposed offshore SACs http://www.jncc.gov.uk/page-1455. In total this accounts for around 2.2% of UK waters. These are known as European Marine Sites and are a part of a network of sites called Natura 2000 developed under the EU Birds and Habitats Directives. The Birds Directive requires the establishment of Special Protection Areas (SPAs) for birds. The Habitats Directive requires Special Area of Conservation (SACs) to be designated for other species and for habitats.</p> <p>In addition to European Marine sites Marine Nature Reserves can be set up to provide protection for certain species and habitats, to improve fisheries management with closures, or to protect full ecosystems, rare habitat, or nursing grounds for fish. The three marine nature reserves designated using the Wildlife and Countryside Act 1981 are:</p> <ul style="list-style-type: none"> • Lundy Marine Nature Reserve, North Devon,

^{37/} Terrestrial includes inland water ecosystems.

Goals	Target	UK implementation
		<ul style="list-style-type: none"> • Skomer Marine Nature Reserve, South West Wales, • Strangford Lough, Northern Ireland. <p>The UK is also working towards the development of a network of Marine Protected Areas under the OSPAR Convention. In order to achieve this aim, the UK is making provision for a national level designation through the draft Marine Bill.</p>
1.2. To integrate protected areas into broader land- and seascapes and sectors so as to maintain ecological structure and function.	By 2015, all protected areas and protected area systems are integrated into the wider land- and seascape, and relevant sectors, by applying the ecosystem approach and taking into account ecological connectivity ^{5/} and the concept, where appropriate, of ecological networks.	<p>The UK is mainstreaming the ecosystem approach into all sectors. Recent legislative changes (see chapter III) have placed a 'biodiversity duty' on all public authorities. The Natural Environment Strategic Unit within the Department of Environment, Food and Rural Affairs http://www.defra.gov.uk/wildlife-countryside/natural-environ/index.htm works on a cross-departmental basis to embed the Ecosystem Approach in the UK government's work.</p> <p>Work is ongoing to identify practical ways to measure functional connectivity as one of the UK biodiversity indicators.</p>
1.3. To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries.	Establish and strengthen by 2010/2012 ^{6/} transboundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation	<p>The UK has contributed significantly to the establishment of Natura 2000; the major European scale protected area network. A number of cross-border sites have been established between Northern Ireland and the Republic of Ireland. In the offshore zone, discussions with neighbouring states are ongoing as the network of marine protected areas is established.</p> <p>Twinning arrangements exist between Ramsar sites in the Wash and Waddensee (Netherlands), and between Strangford Lough and sites in Canada and Iceland.</p>
1.4. To substantially improve site-based	All protected areas to have effective management in existence by 2012, using	All protected areas in the UK have legally enforceable management prescriptions, primarily based on land ownership

^{5/} The concept of connectivity may not be applicable to all Parties.

^{6/} References to marine protected area networks to be consistent with the target in the WSSD plan of implementation.

Goals	Target	UK implementation
protected area planning and management.	participatory and science-based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement	within sites rather the site itself. Provisions also exist which address deterioration or damage to sites due to neglect. Conservation objectives are required for all Natura 2000 and Ramsar sites. The effectiveness of site management regimes is monitored and reviewed as necessary to secure where possible the long term viability of the wildlife interests at the sites.
1.5. To prevent and mitigate the negative impacts of key threats to protected areas.	By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.	National sites designations are all monitored on the basis of a national standard of evaluation which is designed to assess the effectiveness of site management regimes and, as a consequence and where possible, stimulate remedial action. Government have set targets for improving the quality of all national sites by 2010.
2.1. To promote equity and benefit-sharing.	Establish by 2008 mechanisms for the equitable sharing of both costs and benefits arising from the establishment and management of protected areas	Most protected areas in the UK are owned and managed privately. Significant resources are available from statutory sources for conclusion of management agreements (formal financial contracts) to safeguard the conservation interests of the sites. A significant focus of agri-environment schemes in the UK has been to encourage landowners and occupiers to ensure that their actions are at least not prejudicial to the interests of protected species and habitats, and in most cases are beneficial. These financial arrangements allow a public good to be achieved by compensating the owners of the resource for extra costs above those which they would be expected to bear as part of their stewardship of the land.
2.2. To enhance and secure involvement of indigenous and local communities and relevant stakeholders.	Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and	Many sites in the UK are in private ownership; advice on their management is available through the statutory nature conservation agencies, and also informally from non-governmental conservation charities. In the UK before national sites are designated consultation takes place with owners and occupiers, local and national governments and other interested parties. Information is also placed in the relevant local press inviting public representations and

Goals	Target	UK implementation
	management of new, protected areas	objections. These can be made in writing or in person where the respective authorities consider final designation of a site. For some sites there management bodies which include members from a range of stakeholders including representatives from the local communities.
3.1. To provide an enabling policy, institutional and socio-economic environment for protected areas.	By 2008 review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems.	<p>The UK has reviewed the policy context for protected areas as part of its ongoing work. This has led to changes in planning policy being implemented. In addition, a review of Ramsar sites in metropolitan UK identified Ramsar interests at sites designated under the EC Habitats Directive (SACs and SPAs) as well as threatened wetland habitats and species not listed in the Annexes of the Directive. This will provide the basis for considering further possible locations of wetland interest features that could in time be listed as Ramsar sites.</p> <p>Following a review in 2004 of existing and potential Ramsar sites in the UK Overseas Territories and Crown Dependencies (UKOTCDs) http://www.jncc.gov.uk/page-3511. Subsequently, a number of new site designations have taken place.</p>
3.2. To build capacity for the planning, establishment and management of protected areas.	By 2010, comprehensive capacity building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards	<p>There are many opportunities for site managers in the UK to obtain training and support, either through formalised academic courses, such as those run by education institutions, or more informally through volunteer networks such as conservation volunteer tasks run by non-governmental organisations such as the British Trust for Conservation Volunteers http://www2.btcv.org.uk/.</p> <p>Advice on management of protected sites is available through the statutory nature conservation agencies, and also informally from non-governmental conservation charities</p> <p>Support is available to the UK Overseas Territories for strengthening capacity to plan, manage and evaluate protected areas, including through the Overseas Territories</p>

Goals	Target	UK implementation
3.3. To develop, apply and transfer appropriate technologies for protected areas.	By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation.	Environment Programme, A number of projects in the UK have sought to ensure that experience in managing protected sites is shared and that lessons can be learnt and transferred to others. For example, The Grazing Animals Project (http://www.grazinganimalsproject.org.uk/) has sought to clarify the best ways to use the different feeding techniques of herbivores to best effect to maintain or enhance conservation interests.
3.4. To ensure financial sustainability of protected areas and national and regional systems of protected areas.	By 2008, sufficient financial, technical and other resources to meet the costs to effectively implement and manage national and regional systems of protected areas are secured, including both from national and international sources, particularly to support the needs of developing countries and countries with economies in transition and small island developing States.	It is impossible to calculate comprehensively the total financial resources either spent on or required for protected areas in the UK as so much is done by individuals using private funds. However, significant amounts are made available from statutory sources through grants from the nature conservation agencies, and through the various agri-environment schemes in operation in the UK. Indicators 16, 17, and 18 http://www.jncc.gov.uk/page-4233 within the UK biodiversity indicators include measures of the amount of resources made available both within the UK and by the UK to other countries, plus volunteer effort. These resources have increased significantly over the past decade.
3.5. To strengthen communication, education and public awareness.	By 2008 public awareness, understanding and appreciation of the importance and benefits of protected areas is significantly increased	Public awareness and appreciation of the natural environment is high in the UK. Protected areas are very often a destination for public visits to the countryside, and much effort has been put into interpretation boards at sites, and awareness raising activities, through both broadcast and printed media. The importance of access to green space is being increasingly recognised by health professionals as a significant factor in the well-being and health of individuals.
4.1. To develop and adopt minimum standards and best practices for national and regional protected	By 2008, standards, criteria, and best practices for planning, selecting, establishing, managing and governance of national and regional systems of protected	For selection of national sites, the guidelines for the selection of biological SSSIs http://www.jncc.gov.uk/page-2303 are used as the basis for evaluating whether a proposed site is up to the standard expected.

Goals	Target	UK implementation
area systems.	areas are developed and adopted.	A similar approach is used for the selection of Special Protection Areas under the Birds Directive http://www.jncc.gov.uk/page-1405 and for selection of Special Areas of Conservation under the Habitats Directive http://www.jncc.gov.uk/page-1460 . The governance process for designation and declaration of protected areas is set out in the enabling legislation for each type of site. The importance of each designation is set out in government policy documents.
4.2. To evaluate and improve the effectiveness of protected areas management.	By 2010, frameworks for monitoring, evaluating and reporting protected areas management effectiveness at sites, national and regional systems, and transboundary protected area levels adopted and implemented by Parties	The UK work on common standards for monitoring designated sites http://www.jncc.gov.uk/page-2219 is focused on setting clear objectives for each feature for which sites are designated in the UK, and undertaking work to assess if these objectives are being met. A report on the first six years of this work http://www.jncc.gov.uk/page-3520 was published in 2006.
4.3. To assess and monitor protected area status and trends.	By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets	Indicator 6 http://www.jncc.gov.uk/page-4241 within the UK biodiversity indicator set, provides an overview of information on the extent and condition of protected sites in the UK.
4.4 To ensure that scientific knowledge contributes to the establishment and effectiveness of protected areas and protected area systems.	Scientific knowledge relevant to protected areas is further developed as a contribution to their establishment, effectiveness, and management	It is part of the role of the statutory conservation agencies in England http://www.naturalengland.org.uk/ , Scotland http://www.snh.org.uk/ , Wales http://www.ccw.gov.uk/Splash.aspx and Northern Ireland http://www.ni-environment.gov.uk/ to give scientific advice to UK and devolved administrations and to ensure that policies are based on evidence.

Appendix IV - National indicators used in the report

The UK is fortunate in having lots of information about its biodiversity, collected across a broad spread of species and habitats by both professionals and amateurs. These data are essential sources of evidence; for developing and reporting policies and actions to conserve biodiversity; for reporting; and for developing indicators.

Indicators are one of the means the UK can communicate the results of monitoring and surveillance. The audience for indicators is extremely broad, from the general public to all parts of the private and public sectors. The idea of a headline suite of indicators, easily understood and communicated to all, supported by a lower tier to aid interpretation and provide more detail, has proved to be a robust model and the most effective solution for communicating such a difficult subject to such a wide audience.

The first version of the UK biodiversity indicators was published in June 2007 both on the internet (www.jncc.gov.uk/biyp), and as a small pocket book. The indicators were updated on the web in May 2008, April 2009, and were published again in parallel with submission of this report.

Eighteen UK biodiversity indicators have been developed as part of the UK implementation of Decision VII.30, although one, habitat connectivity, is still under development and is presented with limited data. The indicators are grouped under the six focal areas aligned to those used by the Convention on Biological Diversity:


1. Status and trends in components of biodiversity
2. Sustainable use
3. Threats to biodiversity
4. Ecosystem integrity and ecosystem goods and services
5. Status of resource transfers and use
6. Public awareness and participation

Whilst indicators are useful tools for summarising broad trends and highlighting high-level messages, they can never describe all the changes in the UK's biodiversity. They are best seen, as their name suggests, as indicative of the general state of biodiversity. Whilst they will form the basis of the UK's assessment of progress towards the biodiversity targets, other factors and sources of information are also being taken into account.


Assessing indicators

Many indicators have a single measure which changes over time (fish stocks in UK waters, for example) but where data cannot logically be combined, such as for the area of sensitive UK habitats affected by acidity and area affected by nitrogen, the indicator will have more than one measure. Each measure is assessed, using a set of 'traffic lights'. The traffic lights assess 'change over time' (whether or not things are moving in the right or wrong direction). They do not assess whether the measure has reached any published or implied targets, or indeed whether the status is 'good' or 'bad', although where targets have been set, these are identified in the indicator text.

 = Improving

 = little or no overall change

 = Deteriorating

 = insufficient or no comparable data

The traffic lights are determined by identifying the period over which the change is to be assessed and comparing the value of the measure in the base or start year with the value in the end year.

For the measures within the indicators on trends in populations of selected species, statistical analysis techniques have been developed in collaboration with the data providers and the assessment is based on this analysis. A green or red traffic light is only applied when there is sufficient confidence that the change is 'significant' and not simply a product of random fluctuations.

For other indicators, the assessment has been made by comparing the value of the measure in the base or start year with the value in the end year against a standard threshold. A three year average is used to calculate the base year, to reduce the likelihood of any unusual year(s) unduly influencing the assessment. Where an indicator value has changed by less than the threshold of 3 per cent, the traffic light has been set at amber. The choice of 3 per cent as the threshold is arbitrary but has been used successfully in other Government Indicators.

The traffic lights only reflect the overall change in the measure from the base to latest year and do not reflect fluctuations during the intervening years.

Where data are available, two assessment periods have been used:

1. Long-term – an assessment of change since the earliest date for which data are available, although, if data do not precede 1996 a long term assessment is not made.
2. Short-term - an assessment of change since 2000 (or the closest date for which data are available)

Overview of trends

The table below summarises traffic light assessments over the longer term and since 2000, for the 18 indicators and their 33 component measures.

Focal area	Indicator number, title and individual measure(s) (where applicable)	Long term change ³⁸	Change since 2000	
1. Status and trends of the components of biological diversity	1a. Population of key species (birds)	Breeding farmland birds	1970-2007	
		Breeding woodland birds	1970-2007	
		Breeding water and wetland birds	1975-2007	
		Breeding seabirds	1970-2007	
		Wintering waterbirds	1975/6–2006/7	
	1b. Population of key species (butterflies)	Semi-natural habitat specialists	1976–2007	
		Generalist butterflies	1976–2007	
	1c. Population of key species (bats)	1978-1992		
	2. Plant diversity	Arable and horticulture	1990-2007	
		Woodland and grassland	1990-2007	
		Boundary habitats	1990-2007	
	3. Priority species			
	4. Priority habitats			
	5. Genetic diversity	Native sheep breeds		
		Native cattle breeds		
6. Protected sites	Area of protected sites	1996-2008		
	Condition of features			
2. Sustainable use	7. Woodland management			
	8. Agri-environment land	Higher type schemes	1992-2008	
		Entry type schemes		
9. Sustainable fisheries	1990-2007			
3. Threats to biodiversity	10. Impact of air pollution	Acidity	1996-2005	
		Nitrogen	1996-2005	

³⁸. The earliest available year is used as the baseline for assessment of long term change. The base year used for each measure is shown in the table. Where data are unavailable, or do not precede 1996, a long term assessment is not given.

	11. Invasive species	Freshwater ecosystems	1960-2008	
		Marine ecosystems	1960-2008	
		Terrestrial ecosystems	1960-2008	
	12. Spring index	Not assessed	Not assessed	Not assessed
4. Ecosystem integrity and ecosystem goods and services	13. Marine ecosystem integrity	1982-2008		
	14. Habitat connectivity			
	15. Biological river quality	1990-2006		
5. Status of resource transfers and use	16. UK biodiversity expenditure			
	17. Global biodiversity expenditure			
6. Public awareness and participation	18. Volunteer time			

= improving

= little or no overall change

= deteriorating

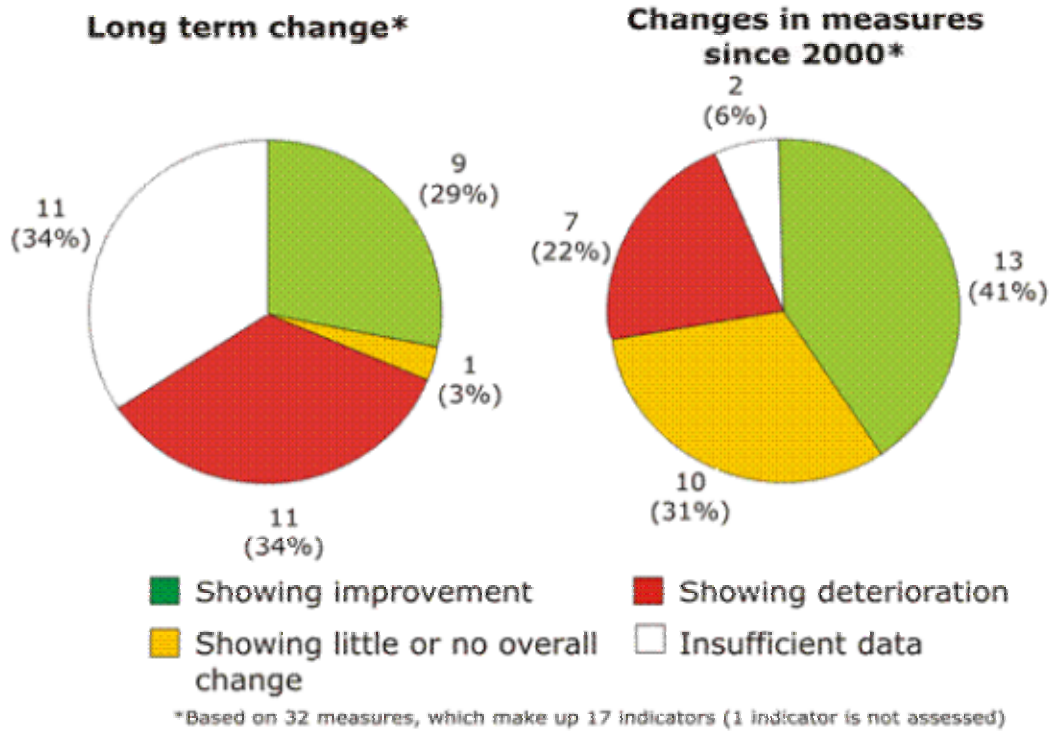
= insufficient or no comparable data

The individual assessments for each measure can be combined to produce an overall assessment. This provides a summary of progress towards the 2010 commitments without the need to combine the indicators themselves.

The pie charts below display the numbers of measures that have shown an improvement (green traffic light), a deterioration (red traffic light), little or no overall change (amber traffic light) or that have insufficient data for an assessment to be made (white traffic light). Assessments of change over the longer term and since 2000 are shown.

As well as overall summaries based on all 32 measures in the 17 indicators, separate summaries for each focal area are shown which are based on the indicators and measures within that focal area. Focal areas 5 and 6 have very few measures and do not have separate pie charts, although all the long-term assessments have insufficient data and all since 2000 assessments are green.

Assessment of change: all measures



Of the 32 measures used to compile the 'all measures' summary chart, 13 (41 per cent) show an improvement since 2000, compared with 9 measures (29 per cent) showing improvement over the longer term. Those showing improvement since 2000 include bat populations, UK BAP priority species, extent of protected areas, sustainable fisheries, and expenditure on both UK and global biodiversity.

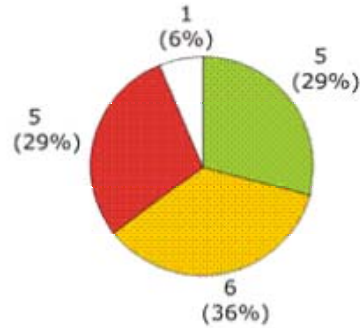
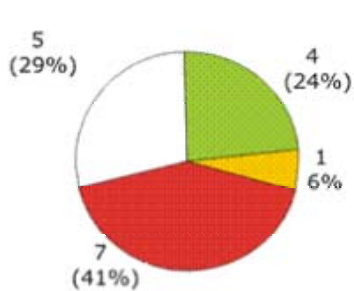
Those measures showing long term deterioration are populations of farmland and woodland birds, populations of specialist butterflies, populations of bats and plant diversity (in woodlands, grasslands and boundary habitats). Some of these measures have continued to deteriorate in the short-term (e.g. farmland birds and the plant diversity of boundary habitats). Woodland birds and specialist butterflies have shown little or no overall change since 2000.

Assessment of change: focal areas

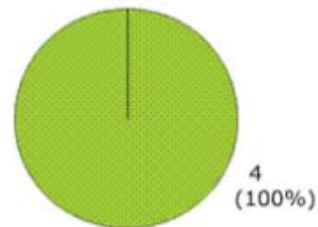
Long term change

Changes in measures since 2000

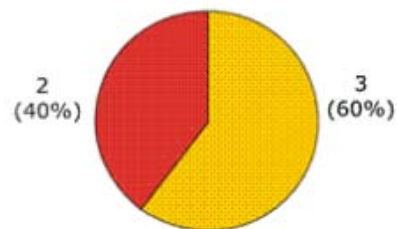
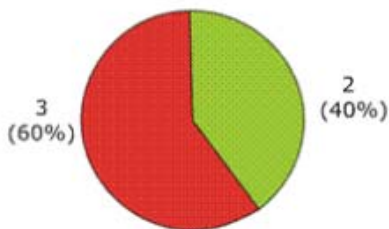
Focal area 1 - Status and trends of the components of biological diversity
(Based on 17 measures which make up 6 indicators)



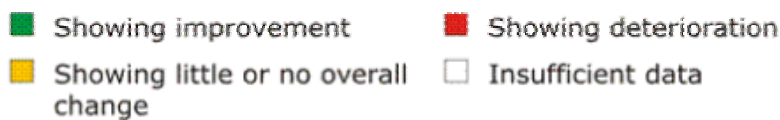
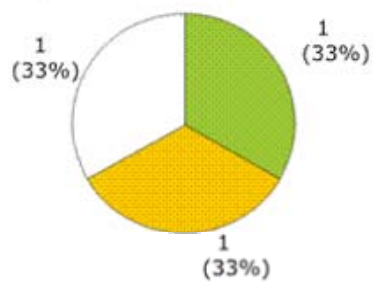
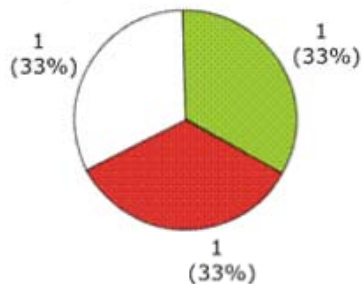
Focal area 2 - Sustainable use
(Based on 4 measures which make up 3 indicators)



Focal area 3 - Threats to biodiversity
(Based on 5 measures which make up 2 indicators)



Focal area 4 - Ecosystem integrity and ecosystem goods and services
(Based on 3 measures which make up 3 indicators)



There were long-term declines for 7 measures (41 per cent) within focal area 1, reflecting the very large declines in bird, butterfly and bat populations seen in the 1970s and 80s. Since 2000 these long term declines have generally slowed, with some measures previously assessed as deteriorating showing either improvement or little or no overall change since 2000. These conclusions should be viewed with some caution as changes are more difficult to assess over the short term. Two measures within focal area 1, breeding seabirds and wintering waterbirds, have changed from a long term improving assessment to deteriorating since 2000.

The indicators in focal area 3 and 4 show little difference in their short-term assessments. Focal area 3 has the greatest proportion of red and amber assessments in both the long and short-term, reflecting a pattern of continuing or growing threat to biodiversity in the UK.

Statements from UK Crown Dependencies and Overseas Territories

States of Jersey

1. The state of biodiversity in Jersey

The 2005 report on the state of Jersey's environment "The State of Jersey" adopted a holistic approach to the preservation of the Island's biodiversity by integrating, analysing and prioritising all environmental information. This report aimed to bring together all environmental information and to provide a baseline from which future change can be measured. It also integrated environmentally related aims into the Island Government's Strategic Plan 2005-2010. The Report identified 12 environmental perspectives for Jersey and by analysing these perspectives using a Pressure – State – Response model developed the most appropriate indicators to monitor change and regularly report progress

The major indicator species and apparent trends are as follows:

Marine Mammals

Target: No major change in reported sightings.

Latest Result: 42 sightings reporting in 2007 compared to 79 in 2007. Drop in sightings likely to be an artefact of reduced reporting rather than actual reduction in mammal abundance.

Status of Migratory Birds (average counts at key sites)

Target: No declining trends.

Latest Results: Overall no decline. Improvements recorded at St Ouens pond and St Catherines Wood sites.

Status of Bat Populations - roosts

Target: Increase number of registered roosts.

Latest Results: Increase from 72 roosts in 2005 to 98 in 2007.

Status of bat populations – key foraging sites

Target: No declining trends in species diversity and abundance.

Latest Results: No result in 2006 due to technical problems, only 9 of 24 sites analysed so far in 2007.

Terrestrial Site Quality - Butterflies

Target: Increased diversity, distribution and abundance of butterflies across a variety of habitats Islandwide.

Latest Results: No significant changes in annual numbers are apparent. In general Sites of Scientific Interest (SSIs) seem to have slightly higher numbers than agricultural or urban land. Monitoring over such a short timescale is not adequate

to draw any meaningful conclusions. By 2010 it should be possible to provide analysis of trends in individual butterfly species populations.

Terrestrial Site Quality - Birds

Target: Increased diversity, distribution and abundance of birds across a variety of habitats Islandwide.

Latest Results: No significant changes in annual numbers are apparent but again longer datasets are required for meaningful analysis. New strategies launched by the Department have resulted in increases in the amount of monitoring conducted during 2005 and 2006. 2005 showed an increase in species abundance with 2006 similar. 2007 figures are not yet available.

Status of Marine Target species

Target: No major change in fisheries catch per unit effort.

Latest Results:

2005: 6

2006: 5.6

2007: 8

2. The status of preparation / implementation of the Jersey Biodiversity Strategy and Action Plan

The Jersey Biodiversity Strategy was published in 2000 and is available online at <http://www.gov.je/PlanningEnvironment/Environment/ReportsPubs/>

Biodiversity Action Plans for Jersey based on the proposals in the biodiversity have now been published for 55 species which fulfil locally developed criteria for declining or threatened species.

Percentage implementation as increased from 31% of individual action plans in 2006 to 60% in 2007.

Number of scarce and threatened native species compared to 2005 levels

Little data is available on the status of all groups of species except for amphibians and lizards; some data for mammals is available.

For vascular plants alone a total of 1725 species are listed in the *Vice-County Census Catalogue of the Vascular Plants of Great Britain, The Isle of Man and the Channel Islands* from the Botanical Society of the British Isles. Frances Le Sueur's *Flora of Jersey* (1984) is the most recent comprehensive record.

The total number of invertebrate species in Jersey is unknown, but it is likely to be very large.

Lichens are an important part of Jersey's flora; St Brelades Churchyard has the highest number of lichen species in the British Isles. The proposed Lichen Flora of Jersey, a joint project with the Société Jersiaise part funded by the Ecology Trust

Fund and the Department will hopefully identify the rare lichens in Jersey. Publication is anticipated Q3 2009.

The technical problems with the biological database (Recorder) are now solved and inputting continues. Eventually we will have a comprehensive database of the status of native species.

Although we hope that the considerable volunteer effort will gradually close the knowledge gap, it is not realistic to suppose that meaningful information on all scarce and threatened species in the Island will be available any time in the near future.

We have adapted to strictures on resource availability by concentrating on indicator species and by identifying species eligible for Biodiversity Action Plans. Already, though, two plant species with action plans are no longer found in their original sites although it is always possible they may re-appear or be found elsewhere. On the plus side the project has achieved the raising of awareness of the action plan species and the public are responding with information of sightings, which has meant that we now know that some species are not as scarce as was at first thought.

3. Work undertaken to bring biodiversity into the mainstream of work by other sectors

The States of Jersey Strategic Plan 2005-2010 (interactive version online at http://www.gov.je/businessplan/strategic_full.aspx) undertakes "To Protect the Natural and Built Environment." 4.1.3. undertakes to "Protect and promote Jersey's environment as one of its most important assets" .The following policies, among others, are relevant:

- *Facilitate coordinated public access to the coast, countryside and built heritage in a sensitive and appropriate manner*
- *Implement policies to protect all habitats, species, special places and buildings from harm through management regimes, awareness raising and regulation, where appropriate.*
- *Incorporate environmental and 'public good' objectives into the stewardship of agricultural land, through the development of environmental improvement and rural enterprise initiatives.*
- *Provide technical scientific advice to ensure good agricultural practice in the Island and protect the Island's flora and fauna from non-indigenous pests and diseases.*
- *Identify, develop and implement schemes to encourage States, States Departments, the business community, non governmental organisations and the Island community to engage them to minimise their impact on the environment in areas such as energy, waste, water.*

The ECO-ACTIVE initiative (<http://www.eco-active.je/>) has provided a focus for cross-sectoral activities, including biodiversity, energy, transport, waste and water as well as ECO-ACTIVE-BUSINESS, an environmental accreditation scheme for local organisations.

The Jersey Biodiversity Partnership is a group of volunteers, supported by government secretariat who are involved in recording and monitoring.

There are several groups carrying out practical conservation work which are supported by staff from the finance sector.

The agricultural sector is supported by the countryside renewal scheme which provides grants for environmentally sympathetic agricultural activities.

Each year all school students are involved in environment week, a week in which schools are encouraged to take part in a range of visits, talks and practical activities, which is supported by grants from the Jersey Ecology Trust Fund.

4. A statement on whether the 2010 target to reduce the current rate of decline of biodiversity has been met

A five year reporting period was set for biodiversity monitoring and the first report is due in 2010. Until that time it is not possible to provide evidence on whether the 2010 target has been met, although indications are provided in 2 above.

5 Conclusions

Communications between UK government and Jersey, other Crown Dependencies and Overseas Territories has improved greatly in recent years, due in no small part to the efforts of the United Kingdom Overseas Territories Conservation Forum. The UK government, through DEFRA and JNCC have started to provide training, advice and information which is much appreciated.

Contracting Party	UK (Jersey)
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Statements from UK Crown Dependencies and Overseas Territories

Bermuda

1. The state of biodiversity in the OT

Being an isolated oceanic island the native terrestrial biodiversity of Bermuda is relatively low. The very high human population density puts pressure on the native biodiversity from land development and the introduction of invasive species and feral animals. Privately owned open space is under huge development pressure due to the high price of land. Biodiversity is however being sustained in private gardens and on golf courses. Also examples of most of Bermuda's terrestrial habitats are represented within a system of nature reserves and national parks.

Bermuda's marine biodiversity is in better condition than the terrestrial, but is naturally species-poor compared to the Caribbean due to its northern location. Marine fish populations are generally increasing due to a ban on fish pot use in 1990. A notable decline has been observed in seahorses. In the past decade Bermuda has recorded its first invasive marine fish, the Pacific Lionfish (*Pterois volitans*), which is part of a regional problem and is being actively culled in Bermuda waters. Otherwise the reef habitats of Bermuda are stable. Declines have been recorded in offshore sea grass habitat, while some inshore sea grass beds have increased in area. The future of some coastal habitats may be threatened by erosion or inundation resulting from sea level rise.

2. The status of preparation / implementation of the National Biodiversity Strategy and Action Plan

The Bermuda Biodiversity Strategy and Action Plan was launched by the Minister of the Environment at the UKOT conference held in Bermuda in March 2003. This document consists of 12 sections, containing 77 actions which are broken down into 408 activities. Implementation began in earnest in 2005 with the hiring of a full-time coordinator at the Department of Conservation Services and the establishment of a steering committee of volunteers from stakeholder groups.

Some notable successes to date include a well attended Environmental Youth Conference in 2006, the preparation and publication of management plans for threatened species and habitats, a workshop on propagation of Bermuda's threatened plants, and the listing of a number of threatened species under the Protected Species Act (2003).

Bermuda has a very active community of environmental charities and organisations who are key participants in driving the Biodiversity Action Plan forward, both in collaboration with each other, and the Bermuda Government. The BAP is now at the end of its first 5-year cycle, and will be reviewed and updated with stakeholder input.

3. Work undertaken to bring biodiversity into the mainstream of work by other sectors

The Department of Conservation Services consults on a regular basis with landowners, developers and their agents, and the Department of Planning with regard to any proposed development that will impact on conservation-zoned land. Consideration of biodiversity is part of any recommendation made by Conservation Services regarding planning applications. Endemic plants are available at below market cost from the government nursery to encourage the planting of endemic flora on the site of new developments.

Awareness of biodiversity issues is being raised by continuous publication of newspaper and magazine articles, and the ongoing development of online resources. Community participation in activities that protect and promote biodiversity is actively encouraged by government and NGOs. For example the Bermuda Government maintains a network of permanent moorings at popular dive sites to reduce anchor damage to marine habitats.

The Sustainable Development Strategy and Implementation Plan, launched in June 2006, includes the continued implementation of the Biodiversity Action Plan as an action item. This hopefully will promote the connection between a bio-diverse environment with healthy functional ecosystems, and social wellbeing and economic prosperity.

4. A statement on whether the 2010 target to reduce the current rate of decline of biodiversity has been met.

Since the 2010 target was established many measures have been taken to protect Bermuda's biodiversity. Several endemic species with very specific habitat requirements remain at risk, for example the endemic ferns and invertebrates found in Bermuda's caves. The Protected Species Act (2003) protects the most critically endangered species and management plans have been produced to ensure their continued survival and in several cases *ex situ* breeding programmes have been established. Thus the rate of species loss in Bermuda has been very low and stable in recent time and should remain so. Biodiversity decline, in terms of a reduced number of individuals (and thus associated genetic diversity loss), is still a concern for some native and endemic species. The declining diversity of habitats in Bermuda is more of a concern, with a number of habitats showing drastic reductions in area and in the quality of the habitat that remains. For example both mangrove forests and sea grass beds have declined and active restoration has been undertaken by the Bermuda Government. Monitoring is underway to detect species and habitat decline so that actions can be taken to prevent future biodiversity loss.

Statements from UK Crown Dependencies and Overseas Territories

St Helena

1. The state of biodiversity in St Helena

St Helena's relative isolation in the middle of the South Atlantic gave rise to a high level of endemism. Historical records describe the island at the time of its discovery as being covered in thick woodland with an abundance of animal life and the surrounding waters teeming with marine life. However following the Island's discovery and its use as a stop-over for replenishment of fresh supplies, plants and animals were introduced that eventually competed with those endemic and indigenous. Following human settlement on the Island much of the endemic woodland was used for timber and fodder. The previous introduction of goats (left to browse wild) for fresh meat, also stripped the Island of much of its natural vegetation.

Throughout our history species have been introduced both intentionally and unintentionally and many of these have now become invasive competing heavily with endemic and indigenous species. The earlier destruction of endemic habitats and pressures from introduced competitors caused many species of flora and fauna to decline to numbers that are today classed as rare and or critically endangered, with some species thought to be extinct. Through an analysis of historic records, Cronk (2000)³⁹ described former vegetation as belonging to seven different zones (relating to the different altitudes): Tree fern thicket; Cabbage tree woodland; Moist gumwood woodland; Ebony – gumwood thicket; Scrubwood scrub and saline semi desert. Sadly today only small relicts of these remain and some species have been reduced to only a few single plants. The key vegetation zones today consist of remnants of tree fern thicket; pastures, woodlands and cultivated land; scrub and semi-desert.

Biosurveys are conducted twice per year to monitor the increase and or decrease in the populations of endemic and specific invasive and indigenous species. Under the South Atlantic Invasive Species Project (SAISP) an island wide botanical survey was carried out January to June 2008, all higher plant species and ferns were covered. From the data collected it is estimated that there are about 50 endemic plant species, out of an Island total of 450. A few species known to have occurred here were not recorded and there were also a few species that could possibly be endemic or indigenous, however this can only be established through genetic testing. The survey also confirmed the presence of a high number of potentially invasive species (documented as such from other similar locations) that have become sufficiently established to become invasive under the right conditions.

Recent baseline surveys of the Island's lower plants found c.120 bryophytes of which at least 20 are endemic and 225 lichens, 8 of which were found that are new to science.

³⁹ Cronk, Q. C. B (2000), *The Endemic Flora of St Helena*. Shropshire, UK: Anthony Nelson

Also from recent baseline data surveys it is estimated that there are 400 - 450 endemic invertebrates.

Although analysis of fossil records show that St Helena was home to no less than 6 endemic bird species, today only the wirebird *Charadrius sanctaehelenae* remains. This species is currently classed as critically endangered following a 43% population decline since 2000. The reason for this decline and hence threats to this species are the degradation of grazed pasture land (which is the wirebirds' preferred habitat) due to decreasing numbers of grazing livestock; and pressure to release land that is wirebird preferred habitat for built development and infrastructure. An annual island wide wirebird census of 31 sites is conducted along with weekly surveys of 5 key sites.

St Helena has 10 endemic fish. Baseline data on other marine flora and fauna is limited although various programmes have been put in place over the past 5 years to gather baseline data. This includes the monitoring of cetaceans which includes the three types of dolphin found in our waters and seasonal visitors like the humpback whale (*Megaptera novaeangliae*), sightings locations are recorded and photo ids taken; Monitoring of the eight breeding species of seabirds, using total population counts, nest monitoring and colony counts; Underwater fish surveys, looking at numbers and length of (local) commercially fished species and abundance of endemic species of pre-defined groups; Fish length surveys of local commercial catch; Grouper monitoring through otolith extraction to monitor whether the established Maximum Sustainable Yield for this species is working; Benthic surveys recording presence or absence of marine flora and fauna including hard and soft coral, algae, sea urchins, sand and rock. There is also a system in place to record public sightings of unusual marine life. Due to limited expertise in this area, all of the data collected from these monitoring programmes is now with Joint Nature Conservation Committee for analysis.

The main threats to our native biodiversity are those associated with invasive alien species; Limited resources, both human and financial to adequately design and implement plans, policies and projects; Economic pressures on land and resources; and a general lack of understanding at all levels of the importance of conserving native biodiversity.

2. The status of preparation / implementation of the National Biodiversity Strategy and Action Plan

There are no short term plans to produce a National Biodiversity Strategy and Action Plan (NBSAP) for St Helena. We do have our Environment Charter Strategy for Action which was produced in 2005 with full stakeholder participation. This Strategy lists all the actions, programmes and projects felt necessary to meet the Environment Charter Commitments and this includes biodiversity - related ones and those relevant to the implementation of the Convention on Biological Diversity.

We are also working to Species Recovery Plans for 12 of our endemic species; A Protected Areas Plan for the Central Peaks 2007 – 2010; and A Wirebird Species Action Plan. Work done under the SAISP should also inform medium – long term cost

effective strategies to combat the spread of invasives and reduce their threatening status.

The implementation of the Environment Charter Strategy for Action and the specific species and habitat plans are in essence components of what such a National Biodiversity Strategy and Action Plan could contain. Whilst it would be ideal to build on this work to create an overarching document that gives biodiversity its due recognition at National level, we do also need the right organisational structure in place to ensure effective implementation. Currently the environment sector within the St Helena Government is spread across quite a few different Departments each with different roles and responsibilities. It is recognised that this is not an ideal set up and an Institutional Review of the St Helena Government's environmental functions and services was done last year. Recommendations from this Review are now being considered. It would be timely to review the need for, and feasibility of producing and implementing a NBSAP when a decision is made on the environmental institutional set-up.

3. Work undertaken to bring biodiversity into the mainstream of work by other sectors

The St Helena Sustainable Development Plan 2007/08 – 2009/10 which sets out a broad development strategy for the Island recognises the environmental risks and opportunities, which include the recognition that the Island's natural environment especially its biodiversity is a key asset but that increased economic development and increased visitor numbers if not managed correctly can present a threat.

The Land Development Control Plan (LDCP) (2006) sets out the St Helena Government's land use planning policies for the Island, including those relating to infrastructure; housing and tourism development; agriculture and forestry; community, recreation and amenity facilities; quarrying and waste disposal. Included in the LDCP are policies that relate to the conservation of St Helena's biodiversity (including a specific policy relating to wirebird habitat), ensuring that biodiversity issues are at least considered when evaluating planning applications for development. However as St Helena is a small island with limited resources across the board, other factors including financial, economic and technical feasibility have to be taken into account also and as a result biodiversity is not always afforded the right degree of protection.

The LDCP also includes 14 proposed Protected Areas proposed for protection because of one or more of the following, Special natural features and outstanding beauty; Endemic flora and fauna and associated habitats; Outstanding geological, physiographical or historic features; and special scientific interest. Whilst the LDCP therefore provides a form of protection for these areas as the policy of the LDCP is that inappropriate development will not be permitted in these areas, we are also working towards having each proposed protected area afforded legal protection under the National Parks Ordinance.

Prior to the enactment of the new Land Planning and Development Control Ordinance (2008), Environmental Impact Assessments (EIAs) were not legally mandatory for development proposals. This new Ordinance does however make provision for this.

Although this Ordinance was not in force at the time, the proposed airport development for St Helena was subject to a rigorous environmental assessment (a condition imposed by the UK Ministers), this resulted in the identification of key areas where substantial mitigation works need to be carried out and this includes wirebird habitat restoration and an extensive landscape and ecological planting scheme, both of which have now started.

Biodiversity needs and supporting work will also be highlighted as important in the Agriculture and Natural Resources policy framework which will be completed shortly.

4. Statement on whether the 2010 target to reduce the current rate of decline of biodiversity has been met

St Helena is not specifically working towards the 2010 target although most of the specific goals and targets under this are contained within our Environment Charter Strategy for Action. However whilst we have begun to implement this Strategy, limited resources have and will continue to impede progress and whilst it is very likely that we will be working towards some elements of the 2010 target by 2010, we will not have fully met the target.