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JOINT NATURE CONSERVATION COMMITTEE

A UK VISION AND STRATEGY FOR NATURE CONSERVATION

1. Introduction

1.1 In 2006 the JNCC produced its '*Ideas for a UK Nature Conservation Framework'*. During 2007, the Joint Committee's Vision Working Group has been considering:

i. the identification of desired long-term outcomes for nature conservation;

ii. whether the thinking contained in the Vision Framework document published in 2006 could be extended to the Crown Dependencies and Overseas Territories.

1.2 In this paper, the Vision Framework document has been shortened to cover its main aspects, and re-written so as to make it relevant to the Crown Dependencies and Overseas Territories. The Working Group's initial conclusions with regard to desired long-term outcomes have also been incorporated.

2. A vision for nature conservation

2.1 The United Kingdom Government has developed a Vision for the natural environment. The Government's Vision is set out in the box below.

Our vision is for a diverse, healthy and resilient natural environment, which provides the basis for survival, well-being and prosperity now and in the future

We want:

- the diversity of living things and their habitats conserved and enhanced;
- clean, healthy, safe and productive oceans, seas and inland waters;
- the air that we breathe free from harmful levels of pollutants;
- land and soils protected and managed sustainably;
- landscapes restored, conserved and enhanced and able to adapt to change;
- everyone able to benefit from a diverse, healthy and resilient natural environment.

2.2 While this vision and goals were developed primarily with the United Kingdom in mind, they also have considerable applicability worldwide, and can form the basis of future policy and action by the UK Government both home and abroad.

2.3 Government has not yet developed an overall vision and goals for nature conservation. In 2004, the Joint Nature Conservation Committee agreed a vision for nature conservation which it considered could be applied to the United Kingdom, and could be used to guide the UK's actions abroad. JNCC's Vision for nature conservation is set out in the box below.

> ***Our vision is that the countryside, towns and seas, both in the United Kingdom and abroad, will be rich in wildlife and natural features, contributing to the economy and improving everyone's quality of life.***
>
> This vision contains four high-level objectives:
>
> i. halt and reverse the current loss of biological diversity and maintain the diversity of geological features;
>
> ii. enhance the potential for nature and natural processes to flourish within the appropriate biogeographical context by maintaining, and where necessary restoring, an environment that supports functioning, dynamic and resilient ecosystems;
>
> iii. achieve economic and social benefits from the sustainable use and enjoyment of natural resources;
>
> iv. ensure that people have wide and equitable access to the natural world, and provide sufficient knowledge to help people contribute to environmental decision-making.

2.4 In relation to the United Kingdom and its Crown Dependencies and Overseas Territories, it is assumed here that nature conservation has the following purposes:

i. it is to conserve the range of biodiversity and geodiversity characteristic of the United Kingdom, its Crown Dependencies and Overseas Territories, having regard to the changing climate, and to maintain, and where necessary restore, biological communities and species to levels which are not only viable over time but which are capable of enriching the quality of people's lives in their local neighbourhood;

ii. it is to ensure that the United Kingdom and its Crown Dependencies and Overseas Territories make a full contribution to regional and global nature conservation.

2.5 Nature conservation action will endeavour to provide suitable opportunities for education and research. It will be set within the context of the overriding importance of the provision of ecosystem services as the basis of a prosperous and sustainable economy and of human well-being.

3. Pressures on the natural environment

Indirect drivers of change

3.1 The Millennium Ecosystem Assessment identified the principal socio-economic drivers of environmental change and degradation as being: changes in economic activity; demographic change; socio-political factors; cultural and religious factors; technological change. The significance of each of these is introduced below.

Changes in economic activity

3.2 There is widespread agreement that the eradication of poverty, and the raising of living standards for the world's people to achieve a satisfactory quality of life, are essential human goals. Traditional economics has sought to meet these objectives through economic growth based on increasing the energy supply and the exploitation of natural resources, and through the marketing of goods and services. Simple measures of economic growth, such as Gross Domestic Product and Gross National Product, take no account of the diminishing stock of natural resources nor of environmental degradation; nor, indeed, of the improvements to the quality of life that such measures are intended to reflect. To date, the result of such growth has been massive habitat loss, environmental pollution, breakdowns in ecosystem services such as water supply and soil fertility, and progressive climate change. The economic benefits of growth have not necessarily been transferred equitably to local populations, and the intended quality of life improvements for local people have not materialised to the extent anticipated.

Demographic change

3.3 With the reduction in natural limits to population growth, the global population has increased greatly over the last 50 years, with the consequential increased demand for living space, food, water, use of natural resources and energy, and the supply of goods and services. This has exacerbated the pressures on the environment summarised above in relation to economic activity. In the UK, while overall population has not increased markedly in recent years, changes in social organisation have driven the demand for single person households, and consequently increased demand for housing space.

Socio-political factors

3.4 Worldwide, failings in systems of government and mechanisms for social cohesion can have profound effects on the environment. At its most extreme, such failures can lead to breakdown in internal and external security, leading to civil war or conflicts between states. Such breakdowns can result in major environmental damage and the complete destruction of vulnerable species. Less dramatically, failures of national governance can lead to unsustainable policies being pursued, including short-term drives for growth at the expense of longer-term sustainability, and the use of financial incentives in the support of such initiatives. Incompatibilities between the policies pursued by different

departments within Government are commonplace, often to the detriment of the environment. Similarly, there have been failures in international governance, e.g. through the adoption of inappropriate trade rules which favour market economics above sustainability, with consequential major adverse consequences for the environment.

Cultural and religious factors

3.5 Cultures differ markedly in relation to their social, moral and spiritual values. In some cultures biological resources are seen as being for the purpose of supporting human populations; in others they are respected as part of overall creation. Cultural and religious attitudes towards the use of natural resources, and towards such matters as human birth control, are potentially of major environmental significance because of their impact on demographic structure and population growth, and hence on land use.

Technological change

3.6 Technological change has enabled the development of modern intensive agriculture, modern forestry and fisheries, modern energy supply and industry, and modern transport systems. Technology also provides the infrastructure which supports modern towns and cities. In the past, technology has been primarily directed towards intensifying the use of energy and natural resources to support economic growth and to service the needs of the expanding global human population. Potentially and increasingly, it is being used to support green infrastructures in cities, reductions in pollutant emissions, and the sustainable use of natural resources.

Direct drivers of change

3.7 The Millennium Ecosystem Assessment identified five principal direct drivers of biodiversity loss. These were: habitat loss, invasive species, over-exploitation, pollution, and climate change. The significance of each of these is introduced below.

Habitat loss

3.8 Habitat loss in the United Kingdom has been taking place progressively for at least 6,000 years, primarily as a consequence of the conversion of natural forests to agricultural use, and, over the last 400 years or so, also as a result of urban development. Since 1940, agricultural intensification and commercial re-afforestation have resulted in significant further losses of semi-natural habitat and biological communities. The same processes have been in play in the Crown Dependencies. In the Overseas Territories of the tropics and sub-tropics, major losses of natural habitats have occurred over the last 300 years as a result of conversion of forest and scrub to agricultural use, and as a result of grazing by introduced livestock. Habitat loss in the Overseas Territories of temperate and polar regions has been modest in comparison.

Invasive species

3.9 While invasive alien species have caused some specific problems in the UK and Crown Dependencies, it is in the tropical and sub-tropical Overseas Territories that major problems have been caused, leading to widespread replacement of the natural vegetation with vegetation types dominated by alien species, and the reduction of native species populations as a result of predation by, and competition from, introduced animal species. In the UK and elsewhere, a major potential problem is posed by non-native micro-organisms being introduced accidentally, for example with timber, or in the soil of plants imported for the horticultural trade.

Over-exploitation

3.10 In the United Kingdom, a combination of hunting and habitat loss led progressively in late pre-historic and also historic times to the extinction of Irish deer, reindeer, horse, aurochs, elk, bear, lynx, beaver, wild boar and wolf. In the 19th and early 20th centuries, hunting had reduced the numbers of great whales in both the North and South Atlantic alarmingly, and some seal and fur seal populations were also severely impacted. Conservation measures taken in the latter part of the 20th century have improved the situation as regards sea mammals considerably. Exploitation of turtles in tropical waters greatly reduced turtle populations, but conservation measures are leading to a recovery. Since about 1970, technological developments in the fishing industry led to enhanced fish catches that greatly depleted many commercial fish stocks in the north-east Atlantic, and these pressures continue. The removal of top predators has had a perverse effect on ecosystem structure and functioning. Incidental take of sea mammals and seabirds as a consequence of fishing activity is locally significant, including of common dolphin in waters to the south of the UK, and of albatrosses in the South Atlantic.

Pollution

3.11 In the UK, the main pollutant pressures are acidic emissions, particularly of SO_2 and NOx, and these have damaged some biological communities, and, despite recent improvements, continue to do so. Atmospheric nitrogen, particularly ammonia from livestock units, has raised the nitrogen content of soils and is causing a loss of species richness in some semi-natural habitats, including in grassland and heathland communities. Past inputs of nitrogen, phosphorus and organic matter to waterbodies has resulted in their condition being degraded, though substantial improvements have been made in recent years. The use of pesticides and other toxic chemicals in the past has caused declines in some biological populations (and some effects are still being felt) and the contamination of freshwaters by chemicals used in sheep dips continues to cause concern. Pesticide use on farmlands has caused big declines in farmland bird populations and may be responsible for ongoing declines in moth populations.

Climate change

3.12 To date, the main effects of climate change have been damage to coral reefs as a result of raised sea-water temperatures, including in the British Indian Ocean Territory. Over the next 50 years, climate-induced changes are expected to be profound as a result of: rising relative sea level causing losses of intertidal and low-lying coastal areas, the reduction in the Antarctic (and Arctic) ice sheets, the loss of upland and montane biological communities, and changes in the pattern of rainfall modifying the type and distribution of habitats.

4. Ecosystem functioning

4.1 Ecosystems function as a combination of interactions between air, soil, water and biological communities. Increasingly, it is becoming apparent that, if natural resources are to be managed sustainably, these interactions need to be understood and maintained. Perturbations in these natural processes adversely affect the sustaining of biological communities. Some major past and contemporary issues relating to ecosystem functioning are introduced below.

Air

4.2 The composition of the air has changed dramatically over the Earth's history. The high carbon dioxide levels which were present in the distant geological past were reduced by the gas being bound by photosynthesis into limestone and carbonaceous deposits. This process replaced the high levels of carbon dioxide in the air by high levels of oxygen. The past and current burning of hydrocarbon fuels, together with the loss of tropical and temperate forests, is beginning to reverse that condition and is precipitating a change in climate that threatens to have a major environmental impact globally in the 21st century. The burning of fossil fuels also resulted in major emissions of sulphur dioxide in industrial areas of the UK. These sulphur emissions have now been greatly reduced, but acidic emissions (including nitrous oxides from car exhausts) are still impacting biological communities. Ammonia emissions, primarily resulting from intensive livestock rearing, are leading to increased nitrogen levels in soils.

Topography and soils

4.3 The landscapes and seascapes of the United Kingdom, the Crown Dependencies and the Overseas Territories are the inheritance of its geological past, and the geological and biological processes which have been operating over a long period and which are still in play. In some of the Overseas Territories, notably Montserrat and Tristan da Cunha, volcanic geological processes continue to have a major influence on topography and soils. Many landscapes and seascapes were heavily modified by the last glaciation, both the effects of the glaciation itself, and in the lowering, and then rise, in relative sea level which accompanied it. The British Antarctic Territory, the South Sandwich Islands, and to some extent South Georgia, are still experiencing glacial conditions today.

4.4 In the UK, the topography of the landscape was heavily modified by the last glaciation, and its soils largely derive from mineral soils laid down at the end of the glacial period and modified during the post-glacial period by physical and biological processes. The underlying geology and soils play a crucial part in the storage and release of water, in the cycling of carbon and nitrogen, in the removal of toxic substances from the environment, and in the support of vegetation and other biological components.

4.5 Rising sea levels after the last glaciation, and accompanying wave action, resulted in the coastal topography and shorelines that occur today, with many sea cliffs, shingle and sand bars, their sediment flats and, in the tropics, coral reefs, being developed in parallel with these rising sea levels. Coastal processes of erosion, sediment transport and deposition, and biological reef formation, are still operating today in a manner which changes coastal boundaries over relatively short time periods.

Water

4.6 The passage of moisture-bearing air over rising topography results in the precipitation of rain or snow. Water flowing down slope erodes surface soil and rock, transports sediment, and deposits the sediment in floodplains, lakes and the sea. Water percolating through the soil may be stored in porous rock as groundwater, emerging as springs at lower altitude. Water maintains surface vegetation, and also semi-permanent and permanent streams, rivers and lakes, and supports freshwater biological communities.

4.7 Water evaporating from the soil, vegetation, surface waterbodies and the sea replaces air moisture lost through precipitation. The seas, and to some extent also large freshwater bodies, support phytoplankton which make a major contribution to the uptake of carbon dioxide from the air, and the release of oxygen. The sea also acts as a major carbon sink through, for example, the deposition of limestone.

Biological communities

4.8 Biological communities (phytoplankton and other plants) are responsible for absorbing carbon dioxide from the air and for releasing oxygen. In the soil, bacteria absorb nitrogen from the air and make it available for plant growth, while other soil organisms, particularly micro-fungi, supply plants with phosphorus, in which soils are naturally deficient. Plants convert carbon dioxide into organic matter which provides habitat and food for animal communities. Dead plant material creates a carbon-rich soil which supports a diverse soil community and improves the soil's fertility and water storage capability. In the sea, planktonic plants combine calcium and carbon dioxide to form the microscopic shelly structures that in due course combine to form limestones. A range of biological organisms secrete calcium carbonate to form reef structures, including the massive coral reefs of the tropics.

5. Geodiversity and biodiversity

Geodiversity

5.1 The surface rocks of the United Kingdom, the Crown Dependencies and Overseas Territories reflect over 3,000 million years of the Earth's 4,600 million year history. These territories incorporate parts of two continental land masses (the Eurasian and the Antarctic), together with islands whose origins are volcanic, the result of coral limestones being uplifted, or continental fragments. Geological processes remain active today, and include volcanic eruption, glaciation, rock weathering, landslide, sediment transport and deposition, and coral reef formation.

5.2 Important geological exposures include those which are natural, and also those which are man-made. In the United Kingdom, a large number of former geological exposures have been obscured by landfill or through development, and many natural process systems, particularly those of major river systems or along coasts, have been disrupted by man-built structures and coastal defences. Nonetheless, a large part of our Earth heritage remains intact.

Biodiversity

5.3 The terrestrial biodiversity of the United Kingdom largely results from the re-colonisation of the country from mainland Europe at the end of the last ice age, with subsequent habitats and landscapes heavily modified by some 6,000 years of agriculture and by an expanding human population. The post-war intensification of agriculture, the conversion of native woodlands to conifers, and the re-afforestation of moorland to conifer plantations resulted in UK semi-natural habitats and species populations being reduced by about a third in the 50 years between 1940 and 1990. Similar pressures were experienced by biodiversity in the Crown Dependencies. Since 1990, evidence indicates that re-direction of agricultural and forestry incentives, together with enhanced conservation action, is proving reasonably effective in halting the post-war decline, but this stabilisation is at a much reduced level from that present in 1940. The marine biodiversity of the UK continental shelf and adjacent seas has largely remained intact, but increased effectiveness of fishing gears since *ca* 1970 has greatly reduced coastal commercial fish stocks and has damaged marine habitats.

5.4 The Overseas Territories of the Caribbean, mid-Atlantic and Pacific islands have been isolated from neighbouring land areas for millions of years and speciation has resulted in high levels of endemism. However, much of the original vegetation of these islands has been removed and natural communities are now much reduced from their original state. In the semi-arid islands of St Helena and Ascension, much of the land territory now comprises scrub, rock, and introduced plants, including cacti, while in Tristan da Cunha most of the original fern bush has been cleared by livestock grazing. The marine environments of the tropical islands remain largely intact with extensive coral reefs in the Caribbean, around Henderson Island in the Pitcairn group, and, in particular, in the British Indian Ocean Territory (though the reefs of the latter have been affected by coral bleaching).

5.5 The territories of the South Atlantic and the British Antarctic Territory have been much less modified by human activity. Although the natural vegetation of the Falkland Islands has been degraded by burning and overgrazing, the natural communities are largely intact. Ice and permanent snow cover much of South Georgia, the South Sandwich Islands and the British Antarctic Territory. The seabird and sea mammal populations of these territories, although reduced by exploitation in the past, are still outstanding. The marine environments of the South Atlantic are largely undamaged and include a large number of invertebrate endemics on isolated sea mounts.

6. Strategy for Nature Conservation

6.1 The UK Government has not yet developed an overall strategy for nature conservation. The Joint Nature Conservation Committee has proposed a strategy for nature conservation which, it believes, can be applied to the United Kingdom, the Crown Dependencies and the Overseas Territories, and also used to guide UK policy and investment practice abroad. The JNCC's conceptual model envisages a nature conservation strategy based on five nested scales. These scales are: i) the *Wider World*, ii) the *National Territory* and (*sub*) *Regional Sea*, iii) *Terrestrial Ecosystems* and *Marine Landscapes*, iv) *Protected Areas*, and vi) *Priority Habitats and Species*. These scales differ from each other not only in geographic size, but also in relation to the level at which action needs to be taken. At the Wider World scale, for example, action will need to be at the inter-governmental level, while for Priority Habitats and Species, action will be needed at the local level.

6.2 In this model, action taken at the higher scales may, if successful, remove pressures experienced at local level and avoid the need for local remedial action. In practice, complementary action often needs to be taken at several of the scales concurrently. In the following sections, the individual scales of action, and the issues needing to be addressed under them, are set out in more detail.

1. *The Wider World*

6.3 The Wider World refers to all geographical scales larger than the national territory, including regional scales (e.g. Europe, or the North or South Atlantic), and also the global scale. It is also intended to deal with jurisdictional issues above the scale of national jurisdiction (e.g. laws and treaties determined by the European Union, Regional Conventions or the United Nations).

6.4 Nature conservation policy actions at this scale would include:

i. developing and promoting means of measuring economic growth and national wealth which take account of the changing state of a nation's natural capital and the values of its ecosystem services;

ii. promoting sustainability appraisal as an underpinning mechanism to guide international policy and practice;

iii. promoting, and indeed achieving, sustainable UK practices in relation to imported goods, foreign investment, foreign aid, and tourism abroad, that are likely to have a significant impact on the biodiversity or geodiversity of other countries;

iv. promoting the reduction of carbon dioxide emissions and the mitigation of ocean acidification and ensuring that the likely consequences for ecosystems of a range of carbon dioxide levels and ocean acidity are appropriately researched;

v. achieving the improved management of marine areas outside national jurisdiction (i.e. the 'High Seas'), in particular through the promotion of sustainable management of fisheries in these waters, and also through the identification and conservation of a network of marine protected areas in the high seas of the North-east Atlantic, Antarctic and elsewhere;

vi. achieving effective action by regional authorities to ensure that fishing is limited to sustainable fishing practices, including in relation to sharks, skates and rays, deepwater fish and sensitive benthic communities;

vii. further improving the direction of economic incentives, such as taxes, property rights and subsidies, to support sustainable development. In particular, to broaden the base of incentives in the rural environment to secure not only food production, but also the supply of other ecosystem services to the human community as a whole (e.g. tourism, climate regulation and water regulation), and to provide a pollution-free environment capable of sustaining a fully characteristic biodiversity;

viii. promoting action to conserve UK, Crown Dependency and Overseas Territory migratory species in other parts of their range.

2. *The National Territory - The (Sub) Regional Sea*

6.5 This scale relates to the territory under national jurisdiction, including that within the jurisdiction of the UK Government, the devolved administrations, and the governments and administrations of the Crown Dependencies and Overseas Territories. The marine component of national jurisdictions often forms part of a much larger marine area shared with other countries. It can be helpful to sub-divide this large sea area into sub-regional seas for the purpose of decision making and management where there are good administrative or biogeographic reasons for doing so.

6.6 Nature conservation policy objectives at this scale would be likely to include:

i. contributing to achieving a cultural change aimed at increasing the efficiency of use of energy and natural resources, while maintaining the national income. This will include supporting measures to reduce waste, including the wasteful use of energy, and of promoting economic activity which enhances the quality of life but is low in the consumption of energy and natural resources;

ii. promoting the use of economic incentives and disincentives, and the setting of mandatory standards, capable of meeting essential environmental goals;

iii. promoting the value of large-scale spatial planning and planning guidance, including marine spatial planning, based on the ability of ecosystems to support human activity in the long-term;

iv. promoting sustainability appraisal as a tool for determining the desirability of future development and other human activity, and helping to develop and refine the tools needed to implement this;

v. promoting action to achieve a progressive reduction in nitrogen and other air pollutant emissions;

vi. ensuring that the role of (organic) soils as sinks and potential sources of carbon is sufficiently recognised and that appropriate policies are adopted and measures taken to minimise carbon emissions from soils, and restore their ability to fix carbon;

vii. ensuring proposals for the introduction of novel organisms are subject to appropriate risk assessment and sustainability appraisal, and that the necessary measures are in place to prevent and control such introductions, and where necessary to eradicate introductions which have taken place;

viii. ensuring appropriate legislation and policy is in place where it is necessary to meet the above objectives, and also to provide for the establishment and management of protected areas, and for habitat and species protection and conservation.

3. *Terrestrial Ecosystems and Marine Landscapes*

6.7 This scale addresses nature conservation needs at the level of relatively large-scale ecosystems or whole landscapes. Such ecosystems and landscapes normally include a range of different habitat types operating together as part of a larger ecological system. In the UK, and elsewhere, it is likely to include: i) montane ecosystems, ii) lowland and upland agricultural ecosystems, iii) forest (plantation) ecosystems, iv) freshwater ecosystems (usually as a component of the other ecosystems), v) urban ecosystems, vi) coastal ecosystems, vii) marine landscapes (including sediment plains, reef systems,

sea mounts, continental slopes, ocean floor). In the Overseas Territories, other types of ecosystem and landscape may need to be added to this list, e.g. polar and scrub ecosystems.

6.8 Nature conservation objectives at this scale are likely to include:

i. regional and local spatial planning to ensure that the location and undertaking of development and other major activities is in accordance with the principles of the ecosystem approach;

ii. requiring that sustainability appraisal is undertaken prior to authorising major new undertakings;

iii. enabling natural processes to operate in relation to fluvial and coastal systems to the extent practical;

iv. planning and implementing ecosystem and habitat restoration schemes so as to reduce the effects of past fragmentation, increase connectivity and overall coverage of semi-natural habitat;

v. the taking of management measures to reduce emissions of carbon, nitrogen and sulphur;

vi. promoting better housing design so as to reduce energy loss, minimise natural resource use, enable people to enjoy wildlife close to where they live and creating green infrastructure in the urban environment;

vii. ensuring that the role of soils and other habitats in maintaining ecosystem services (absorbing carbon, regulating water supply, removing pollutants etc) is recognised, and these services maintained.

4. *Protected Areas*

6.9 This scale is concerned with specific areas of land or water which are designated and protected for their nature conservation value. They are usually areas of high-quality habitat, or are areas which contain large numbers of species, including rare or endemic species, or which support large populations of animal species, or which are of high geological importance.

6.10 Nature conservation actions at this scale are likely to include:

i. identifying and establishing a sufficient network of protected areas;

ii. managing these areas in a manner designed to perpetuate their biodiversity and maintain geodiversity, having due regard to environmental changes, including climate change, over time;

iii. ensuring that degradation of the areas due to human activities or natural events is minimised, and, where it occurs, that remedial action is taken to the extent practical;

iv. managing the areas so as to enable them to act as reservoirs of biodiversity capable of recolonising biologically-impoverished adjacent areas;

v. to the extent practical, managing the areas so as to provide a resource for scientific research, education and training, and also as a resource for public enjoyment and well-being.

5. *Priority Habitats and Species*

6.11 This scale is concerned with addressing nature conservation needs not met by action at the other scales of the strategy. It will be largely concerned with local conservation action needed to maintain viable populations of endangered or severely threatened species or biological communities in order to restore them to a viable condition. It can include action to restore severely diminished areas of habitat to a desired, more extensive, condition.

6.12 Nature conservation actions at this scale are likely to include:

i. ensuring the list of priority habitats and species is appropriate through the application of objective national criteria;

ii. identifying which habitats and species on the priority list require specific action, and the nature of that action;

iii. ensuring that appropriate action plans for habitats and species requiring specific action are prepared and implemented including within the context of the Terrestrial Ecosystems-Marine Landscapes and also Protected Areas levels of the framework;

iv. ensuring that the needs of priority habitats and species which are better met by action at other levels of the framework are taken sufficiently into account at those levels;

v. ensuring that the status of priority habitats and species is sufficiently monitored and that, where necessary, conservation action is modified where it has proved inappropriate or insufficient.

7. Desired long-term outcomes

7.1 Targets have been set by the United Kingdom Government for a wide range of environmental and nature conservation parameters, but these tend to cover periods of 5-15 years, and far fewer longer-term aspirations have been identified. The identification of desired outcomes aimed to be achieved over a 25-50 year period is not easy, because of the difficulty of foreseeing the global and national context within which these outcomes will need to co-exist. However, the proposed desired long-term outcomes for nature conservation set out below should act as a guide for future UK policy action.

7.2 In the following text the timeframe for the suggested desired outcome is for it to be achieved by or before 2050 unless otherwise specified. Only the targets listed under i. in the *Habitats* section have been adopted by Government. Where, in the text below, reference is made to the UK, the outcome is intended to relate to the UK specifically. Elsewhere, it is considered that the outcome may be equally relevant to metropolitan UK, the Crown Dependencies and the Overseas Territories.

1. *Global biodiversity and geodiversity*

i. **Take national action to avoid damaging biodiversity and geodiversity abroad**

Prevent any damaging impacts on global biodiversity and geodiversity originating from UK activities such as trade, development aid and tourism.

2. *Landscapes/Ecosystems*

i. **Achieve desired oxygen-producing and carbon-removing capability of land and sea areas, and desired contribution to these of the main habitat types**

Photosynthetic capability of marine waters is maintained at or above [2000] levels, and a similar outcome for global waters is achieved. Photosynthetic capability of land areas is increased by [20%] above [2000] levels (through greater use of broadleaved woodland, increasing crops providing permanent land cover, greening urban areas). Global photosynthetic capability of land areas is restored to [2000] levels (through sustainable agriculture, protection of forests and re-afforestation programmes).

ii. **Maintain landscapes/ecosystems to perpetuate (where necessary restore) their biodiversity, geodiversity, historic and cultural values, ensure these landscapes/ecosystems are valued by people and are able to support them economically**

The diversity of the country's landscapes, reflecting their topography, underlying geology, natural processes, characteristic biodiversity, previous land-use and historic features, is maintained and managed so as to perpetuate their intrinsic character and also their functionality, including in terms of storage and release of clean water and the maintenance of biological systems. Society ensures that its use of these landscapes generates sustainable incomes consistent with its wish to maintain and restore the beauty and heritage values of the landscapes. Landscapes containing areas of high biodiversity value are managed so as to support the maintenance of that biodiversity.

iii. **Maintain (and restore) landscapes/ecosystems capable of supplying an optimal range of ecosystem services, and which enable natural processes and dynamism to operate**

River catchments are managed so as to use their natural characteristics

to store water and to regulate the discharge of clean water to watercourses. To the extent consistent with protecting human settlements and transport systems, the dynamism of river systems is allowed to operate, with floodplains allowed to function naturally to accommodate floodwater safely, and natural coastal systems of erosion and sedimentation are freed from human interventions and allowed to operate. Society ensures that future development and infrastructure works are planned so as to accommodate this natural dynamism, and, where possible, has restored such systems by removing inappropriate infrastructure.

iv. **Maintain (and restore) the connectivity and permeability of landscapes and ecosystems, so that their components support species, the viability of species populations and their ability to adjust to climate change**

The connectivity and permeability of landscapes are maintained and, as necessary, restored, to the point where the great majority of species populations are maintained over time and enabled to adjust to climate change. Landscapes currently exhibiting low levels of connectivity and permeability (i.e. landscapes within which habitats are very fragmented) will have these characteristics restored to at least the current national average for their ecosystem type (lowland agricultural system, upland agricultural system etc), while areas exhibiting these characteristics above the national average will have them maintained at least at current levels.

v. **Enhance the sustainable management of urban environments**

The use of greenfield sites for new development is phased out completely.

An integrated approach is taken in the planning of towns and cities to reduce the likelihood of water run-off and flooding (e.g. through sustainable drainage systems, green pathways and green roofs), while also enhancing their carrying capacity for wildlife (e.g. maintenance and provision of green corridors, parks, gardens, habitat fragments and rooftop gardens). Public knowledge of wildlife issues is improved and conflicts between the public and wildlife are resolved.

vi. **Enhance the quality of life in towns, cities and villages through wildlife experiences**

Everyone can wake up in the morning to the sound of birdsong and daily experiences natural features like trees, grassland and gardens. Everyone lives only a short walk away from an area of (near-natural) green space, and has the opportunity to contribute to local measures supporting local wildlife. Quality of (near-natural) green spaces in or near urban areas is restored and obstacles to public use, such as safety issues, addressed.

vii. **Maintain, and where needed restore, biodiversity in the marine environment**

The Marine Trophic Index of a sea area reflects its ecological structure. The Index is calculated by assigning a score to each of a suite of monitored fish and invertebrate species based on its position in the food chain (top predators score high, herbivores score low); the higher the Index, the closer the ecosystem to its natural structure.

The UK Marine Trophic Index is restored to its estimated 1980 level. The proportion of fish greater than 30 cm in length is restored to 1.4 times 1997 estimates, and mean weight of fish is restored to 1.3 times 1997 estimates.

3. *Habitats*

i. **The extent of the UK's habitats is restored to the desired levels**

The extent of habitats is restored to meet the UK's biodiversity targets. The trend for habitat fragmentation is reversed so that large areas of functioning habitat are created. Desired outcomes for increases in the extent of habitats from the current situation are as follows:

Native woodland: an additional 135,000 ha is created by 2015; of this 26,000 ha to be native pinewoods.

Lowland heathland: an additional 15,250 ha is created by 2030 (doubling the current extent of heathland) mainly by linking fragments to create more sustainable heathland patches.

Cereal field margins: an additional 18,000 ha is created by 2015.

Lowland calcareous grassland: an additional 9,700 ha is created or restored by 2020.

Lowland meadow: an additional 3,200 ha is created or restored by 2020.

Reedbeds: an additional 3,000 ha is created by 2020.

Fens: an additional 2,000 ha is created by 2020.

Intertidal habitat: an additional 3,600 ha, primarily saltmarsh and mud flats, is created by 2015 (to offset losses due to sea-level rise).

For some of these habitats, additional restoration and expansion will be required up to 2050 beyond that identified in the current targets.

The current extent of peatlands, upland calcareous grassland and montane habitats is maintained at their present extent subject to the constraints of climate change, but, in addition, improvement in condition of these habitats (see ii below) is achieved to prevent further loss in extent over time. Connections between upland and lowland habitats are restored, and, in parts of the uplands, the natural treeline is reinstated.

ii. **Habitat quality is maintained at, and where necessary restored to, a favourable level**

In the UK, the condition of habitats for designated sites is maintained at, and where necessary restored to, favourable condition, and at least 90% of all UK near-natural habitats are similarly in favourable condition. The biodiversity value of farmland is significantly enhanced above 2000 levels.

iii. **Reduce land area under uses of low economic and biodiversity value to secure desired outcomes for habitats**

Increases in the area of native woodland are achieved primarily by conversion from conifer plantation and through the re-wilding of selected areas of upland acid grassland. Increases in lowland heathland are achieved by scrub removal, and by conversion of conifer plantation and marginal farmland. Increases in the other habitats are largely achieved by conversion of marginal farmland.

iv. **Achieve habitat mosaics needed to support the range of species populations**

Habitats are managed so as to complement each other in meeting the needs of those species requiring close proximity of different types of habitats, as well as the needs of species which are habitat-specific.

v. **Achieve the conservation of marine habitats and their characteristic biological communities**

Human activities in the marine environment are managed so as to enable the maintenance and, where appropriate, restoration of the biological communities of the seabed and adjacent water column. Present habitat mosaics are perpetuated and measures taken to ensure the connectivity and permeability of the seabed environment, to enable marine biological communities to adjust to environmental change.

4. *Species*

i. **Maintain (and restore) our species diversity as viable populations through functioning ecosystems, accepting that the relative abundance of species will vary as land use/climate changes**

The current decline in species richness and populations and resilience to loss of viability is halted. The richness and abundance of species in non-urban areas are restored to at least the current national average for their ecosystem type (lowland agricultural system, upland agricultural system etc) and habitat character, while areas supporting species richness, abundance and resilience above the national average are maintained at least at current levels.

ii. **Maintain the diversity of wildlife commensurate with our (changing) climate, accepting colonisers from near Europe and also unavoidable losses due to climate change**

Nature conservation in the UK accommodates the movement of native species within their changing climate space, and colonising species which are native to near Europe are accepted as components of UK biodiversity, and managed as such, having regard also for their potential to be an invasive threat to habitats and species in their new locations. Management favours the establishment of colonising species which are conservation priorities in Europe.

iii. **Have no new non-native organisms, originating outside the biogeographic zones of which the UK is a part, establishing as persistent components of our species diversity**

Management controls on the deliberate or accidental introduction of species, are sufficient to prevent the introduction of the great majority of these species into the country, and eradication action is sufficiently timely and effective to prevent any non-native taxa which evade these controls from becoming invasive. Similarly, controls are sufficient to control the introduction of native species not present in naturally isolated areas of the country, into those areas.

iv. **Manage species populations sustainably**

Animal populations are managed to ensure sustainability within their ecosystems. The exploitation of wild animals and plants, including fish and shellfish stocks, is confined to populations which are managed sustainably. Imports of wild animals or plants, and their products, from abroad are limited to sustainably-managed stocks.

v. **Maintain (and restore) the distributional ranges of our native species**

Within the limits imposed by climate change, the distributional ranges of the great majority of our native species are maintained (or restored) to that pertaining in 1950.

5. *Air*

i. **Achieve air quality sufficient to maintain the UK's characteristic biodiversity**

Air pollution in the UK is reduced to a level which does not compromise the nation's characteristic biodiversity.

ii. **Critical load targets for the major air pollutants are achieved**

A critical load is the estimated level of deposition below which present knowledge indicates no significant harmful effects on a specified, sensitive element of the environment. By 2050, 90% of the area of sensitive protected sites will be below the critical loads for acidification and nutrient nitrogen deposition required to ensure the survival of characteristic plant, lichen and fungi communities.

6. *Water*

i. **Desired outcome for groundwater levels**

Groundwater levels are sufficient to maintain watercourses and wetlands in a satisfactory condition. No groundwaters are drawn down at any time by more than 10% of levels that would exist in the absence of man.

ii. **Desired outcomes for surface water flows**

River flows are maintained at levels sufficient to support their characteristic biodiversity, with abstractions and impoundments being regulated to minimise effects on natural flow regimes. Except in cases of over-riding public interest (e.g. potable water supply and hydropower generation), flushing rates and seasonal water-level fluctuations are restored in lakes to reinstate their natural hydrological regime.

iii. **Groundwater quality**

The quality of groundwaters allows the characteristic biodiversity of aquatic habitats to flourish. In particular, phosphorus levels are stable and close to natural concentrations, and nitrogen levels are reduced to a level consistent with the natural trophic status of groundwater-fed habitats.

iv. **Quality of surface waters**

Water quality in at least 95% of river length and 95% of surface areas of lakes, estuaries and coastal waters is sufficient to support their characteristic biodiversity. Phosphorus and nitrogen levels are stable and appropriate to river, lake and estuary type. Organic pollution does not constrain the full expression of the characteristic biodiversity of each habitat type. Acidified river and lakes are restored and pH/acid neutralising capacity values are appropriate to river and lake types. Dissolved oxygen levels are able to support the health of characteristic fauna.

v. **Outcomes for toxic chemical/pesticide content of surface fresh waters and estuaries**

Toxic chemical and pesticide contents of surface fresh water and estuaries have been reduced to levels which do not affect their characteristic biodiversity.

Discharges of hazardous substances to estuaries are reduced to negligible occurrences by 2020.

vi. **Desired pH and photosynthetic capability of the sea**

The pH of national marine waters is restored to 2000 levels. The photosynthetic capability of the world's oceans is maintained at 2000 levels.

7. *Soils*

i. **Desired organic content and water retention capability of soils/carbon-holding capability of different soil types**

UK peatlands and organic soils are maintained at their 2007 extent and are managed so as to avoid carbon loss due to erosion, over-grazing, burning and drying out. Degraded peatlands are restored to an active peat-forming state where natural conditions allow. No further extraction of peat occurs and peat imports cease.

The soils of semi-natural habitats, and of grazed vegetation, are managed so as to maintain and restore their characteristic organic content. The organic content of arable soils is restored to reflect the natural content of the soil type.

ii. **Reducing soil erosion and sediment transport into watercourses**

Agricultural and forest lands are managed so as to avoid soil erosion and soil transport by water or wind, including transport into watercourses. Soils of highest vulnerability are placed under near-natural habitats.

iii. **Maintain the diversity and biodiversity of UK soils**

The range of soil types characteristic of the country's geology, geomorphological heritage and semi-natural vegetation, are conserved and managed so as to maintain their natural characteristics of ecosystem function capability, their characteristic biodiversity, including micro-biodiversity, their soil structure and other aspects of the national heritage.

8. *Climate change*

i. **Limit climate change to that which will avoid substantial loss of biodiversity heritage**

Average temperature increases are limited to those within the natural temperature range of the great majority of the country's present biodiversity. Average temperatures do not exceed [1970] levels by more than 2°C by 2100.