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JOINT NATURE CONSERVATION COMMITTEE

CLIMATE CHANGE AND NATURE CONSERVATION POLICY: OVERVIEW AND SUGGESTIONS FOR JNCC'S FUTURE DIRECTION

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1. Impacts of climate change on biodiversity

- 1.1 Average global temperatures are projected to rise by between 1.4°C and 5.8°C within the coming century. In the UK, temperatures are predicted to rise by an average of 2°C by the 2050s. Other symptoms of climate change in the UK are likely to include rising sea levels, changes in precipitation patterns (wetter winters and drier summers), and an increase in the frequency and intensity of extreme weather events such as floods and storms.
- 1.2 There is evidence that plants and animals in the UK are already responding to changes in climate. For example, warmer temperatures appear to have led to an earlier onset of springtime events, including trees coming into leaf, amphibians spawning and birds laying eggs. Conversely, autumn events, such as leaf fall, are occurring later. Species distribution patterns may also be changing, e.g. several butterfly species have extended their ranges northwards across Britain in recent decades.
- 1.3 Changes of this sort may appear fairly benign, but climate change has enormous potential to have a damaging impact on the UK's biodiversity. For example, results from the MONARCH (Modelling Natural Resource Responses to Climate Change) project indicate that there are likely to be major changes in species and habitat distributions. Potential changes include the following:
 - i. the distributions of many mountain species (e.g. Trailing Azalea *Loiseleuria procumbens*) are likely to contract;
 - ii. some birds and insects with southerly distributions in Britain (e.g. Reed Warbler *Acrocephalus scirpaceus* and the Large Skipper butterfly *Ochlodes venata*) are likely to expand their range northwards;
 - iii. beech woodland may be lost from southern and eastern Britain as soils become too dry;
 - iv. in response to rising sea levels, salt marshes may move inland (as long as this is not prevented by artificial barriers such as sea defences);

- v. peat bogs and other wetland habitats may be lost from southern England due to summer droughts, but may benefit from increased rainfall in the north and west;
 - vi. most semi-natural habitats will persist but their species compositions may change.
- 1.4 Marine ecosystems in the UK will also be affected by climate change. For example, warm water plankton have moved northwards by 10° latitude compared with the situation 40 years ago. The change in composition of the plankton is likely to affect its suitability as a food source for the young of fish species such as cod, and to result in a shift northwards of this species. Changes are also expected in the communities of benthos, in other fish species and in the populations of seabirds; the recent poor breeding success in some populations of kittiwake and guillemot may be reflecting these wider changes in marine communities.
- 1.5 Globally, there are also predicted to be major environmental impacts (as noted in the recently published Millennium Ecosystem Assessment), such as decreases in agricultural yield, increases in flooding and droughts, increases in soil erosion (with associated consequences for habitats and agricultural and forestry productivity) and the spread of diseases. Impacts on biodiversity in some parts of the world could be devastating, e.g. high latitude/altitude ecosystems, coral reefs and tropical forests.

2. The climate change policy framework

Global

- 2.1 At a global level, the United Nations Framework Convention on Climate Change (UNFCCC) sets the policy framework for action to address climate change. Under this convention, the Kyoto Protocol sets out legally-binding targets for individual countries to limit or reduce their greenhouse gas emissions. The UK's target is to cut greenhouse gas emissions by 12.5% below 1990 levels by 2008-2012.
- 2.2 The Intergovernmental Panel on Climate Change (IPCC) is responsible for undertaking scientific and technical assessments relevant to climate change. It has an important role in developing climate change scenarios. Its 3rd Assessment Report (published in 2001) has been particularly influential through its assertion that climate change is primarily anthropogenic.
- 2.3 Each of the major multilateral environmental agreements has begun to consider climate change as a factor affecting achievement of their objectives, and to develop, to varying extents, collaborative links with the UNFCCC. For example, the Convention on Biological Diversity has produced a report on climate change and biodiversity and has established a joint liaison group with the UNFCCC (and also the UN Convention to Combat Desertification). The IUCN has set up a climate change initiative and at the 2004 World Conservation Congress adopted a resolution on adaptation to climate change.

Europe

- 2.4 The European Climate Change Programme was adopted in 2000. This contains a range of measures to mitigate greenhouse gas emissions, including the EU's emissions trading scheme. More recently, the EU has begun to consider its climate change strategy after 2012, with a Commission communication proposing more ambitious mitigation measures as well as an increased focus on adaptation to climate change. Climate change also features prominently in other key EU policy initiatives, e.g. it is one of the six priority issues in the EU Sustainable Development Strategy.
- 2.5 The UK will hold the Presidency of the EU during the second half of 2005, and is intending climate change to be one of its priorities. In particular, UK Government is keen to promote the inclusion of aviation emissions in the EU emissions trading scheme. Climate change will also be a priority during the UK's G8 Presidency in 2005.

UK

- 2.6 In addition to its commitments under the Kyoto Protocol, the UK has set domestic targets to reduce carbon dioxide emissions (by 20% below 1990 levels by 2010, and by 60% by 2050). The UK Climate Change Programme, published in 2000, contains a framework of policies intended to enable the UK to meet these objectives, including increased use of renewable sources of energy, measures to enhance energy efficiency, and the development of low-carbon technologies. A review of the Climate Change Programme was launched in September 2004, and a revised Programme is anticipated in summer 2005.
- 2.7 Climate change has a high profile in various Government statements of strategic direction, e.g. it is described as 'the greatest threat' in the recently revised UK Sustainable Development Strategy (*Securing the future*) and addressing climate change is one of the four goals in the Energy White Paper published in 2003. Nature conservation policies, such as the country biodiversity strategies, also treat climate change as a priority issue.
- 2.8 The focus of the UK Climate Change Programme is on mitigation measures, and adaptation to the unavoidable impacts of climate change receives little attention. However, Government has made a commitment to produce an Adaptation Policy Framework that will help to integrate adaptation measures into mainstream policies at all levels.

3. Country agency and JNCC engagement in climate change issues

- 3.1 The JNCC's activities in relation to climate change are summarised in the position statement on climate change and nature conservation, approved by the Joint Committee in December 2003. Engagement with UK-wide and international climate change issues is largely provided by an inter-agency

group. JNCC itself currently assigns only a modest level of resources to climate change work.

- 3.2 The country agencies and JNCC have been heavily involved in commissioning research to assess the potential effects of climate change on biodiversity. For example, the MONARCH project has demonstrated how the distributions of animal and plant species in Britain and Ireland may change under various climate change scenarios, and the MarClim project has provided an assessment of climate change impacts on marine biodiversity. A Defra-chaired Marine Climate Change Forum has now been established. JNCC has also sponsored a PhD studentship with the Tyndall Centre for Climate Change Research to investigate the implications of climate change for biodiversity in the UK's Overseas Territories.
- 3.3 The agencies and JNCC have also been active in trying to influence domestic and international policy on climate change. This has included advocacy with UK Government and DG Environment (largely through the efforts of English Nature on behalf of the inter-agency working group climate change), and with the devolved administrations (through SNH and CCW). There has also been some involvement in the global arena, e.g. through English Nature's membership of the IUCN working group on climate change adaptation.
- 3.4 The agencies and JNCC have strongly supported initiatives to reduce greenhouse gas emissions (mitigation measures). Recently, the emphasis has increasingly turned to the need for robust adaptation measures. For example, the theme of the 2005 annual conference of the European Environmental and Sustainable Development Advisory Councils (EEAC) will be the adaptation of biodiversity conservation to climate change. This event will be held in the UK, and is being organised by English Nature and the other UK members of the EEAC.

4. Opportunities and priorities for JNCC and the country agencies

- 4.1 Climate change is predicted to have major consequences, not only for the environment but also for society as a whole. It is essential that JNCC and the country agencies identify their priorities carefully, taking into account the full range of issues relating to climate change and the environment, including both mitigation and adaptation, the range of geographical scales at which climate change operates, and the socio-economic context.
- 4.2 In the short term, there are several opportunities for the country agencies and JNCC to influence UK and EU policy relating to climate change:
 - i. promote the importance of climate change adaptation for EU biodiversity policy through the EEAC annual conference in September, and ensure that the outcomes are fed into other events during the UK Presidency;
 - ii. seek to ensure that the impacts of climate change on biodiversity are adequately addressed in key EU policy developments over the next few

months, e.g. the review of the EU Sustainable Development Strategy and the forthcoming Commission communication on biodiversity;

- iii. contribute to UK Government initiatives, such as the preparation of a climate change Adaptation Policy Framework;
 - iv. ensuring that the outputs of the MONARCH project (which will conclude in 2006) are effectively interpreted and communicated.
- 4.3 In the longer term, what is needed for JNCC is an agreed direction for the organisation's work on climate change, with objectives and priorities to guide activities at UK, European and global scales. Over the next six months, JNCC staff will work with the inter-agency working group climate change to develop recommendations for JNCC's future role, identifying priorities for JNCC engagement and the desired outcomes. This will be based on an assessment of existing legislation and policies and the work being undertaken by other organisations in relation to climate change and nature conservation.
- 4.4 It is proposed that the review will consider JNCC's future work in the following three broad areas:
- i. *Climate change mitigation.* Support for the implementation of UK, EU and global initiatives to reduce emissions of greenhouse gases.
 - ii. *Climate change adaptation.* The development and promotion of measures to adapt policies and practices that affect biodiversity to the environmental impacts of climate change.
 - iii. *Evidence base.* The development of a robust evidence base to underpin policy advocacy.

Some of the major issues for consideration within each of these categories are listed below.

- 4.5 Key issues relating to *climate change mitigation* may include the following:
- i. is there a case for the adoption of more stringent emission reduction targets (e.g. in line with the 2004 EEAC statement on greenhouse gas reduction, which recommends EU targets to reduce greenhouse gas emissions by 30% by 2020 and by 70% by 2050)?
 - ii. what are the pros and cons of energy policy measures that have the potential to reduce greenhouse gas emissions, but which could have other negative environmental impacts, e.g. nuclear power, biofuels? There may be the potential to address both mitigation and adaptation through the appropriate use of crops.
 - iii. what is the potential for land use policies (e.g. forestry and farming) to contribute to mitigation measures through carbon sequestration, and

for the use of old oil and gas fields in the North Sea for storage of CO²?

- 4.6 Key issues relating to *climate change adaptation* may include the following:
- i. what does adaptation look like in practice – what are the principles and techniques?
 - ii. to what extent does the CBD Ecosystem Approach provide a practical tool for implementing climate change adaptation measures?
 - iii. how will traditional site-based conservation approaches need to be modified to take account of climate change, e.g. in terms of site connectivity and defining features of interest on sites?
 - iv. how can adaptation measures be integrated into UK/EU sectoral policies? Do we need revised policies and targets, or just better implementation of existing policies and targets?
 - v. what social and economic shifts will climate change cause, and how will these affect the environment?
 - vi. the effects of climate change may be different from what we expect; how can we accommodate unforeseen changes?
 - vii. how can collaborative working arrangements between biodiversity-focused international agreements and the UNFCCC be enhanced?
 - viii. what practical measures can be developed for climate change adaptation in the UK's Overseas Territories?
- 4.7 Key issues relating to the *evidence base* for climate change may include the following:
- i. what are the research priorities for climate change adaptation?
 - ii. how can existing habitat and species surveillance/monitoring schemes be enhanced to provide evidence for the impacts of climate change (and possibly other environmental pressures, such as air pollution) on UK biodiversity?