



The mission of the European Platform for Biodiversity Research Strategy (EPBRS) is to ensure that research contributes to halting the loss of biodiversity by 2010.

RECOMMENDATIONS OF THE MEETING OF THE EUROPEAN PLATFORM FOR BIODIVERSITY RESEARCH STRATEGY

held under the UK Presidency of the EU
Aviemore, Scotland 2nd – 5th October 2005

on

CLIMATE CHANGE AND BIODIVERSITY CONSERVATION: KNOWLEDGE NEEDED TO SUPPORT DEVELOPMENT OF INTEGRATED ADAPTATION STRATEGIES

I – Knowledge and action

Climate change is being driven by human activities, and will accelerate despite current mitigation efforts. *Having reviewed the available scientific evidence, the participants at this meeting conclude that:*

(a) climate change poses an immediate challenge to the target of halting biodiversity loss in Europe, and to the successful implementation of Natura 2000, for the following reasons:

- there is firm evidence of biological responses to climate change: changes in flowering dates, arrival of migrating birds and fish; these and other phenological mismatches may disrupt ecosystems.
- there is strong evidence that the distribution of many species has responded to climate change. Very many species, however, are unable to disperse sufficiently rapidly to adapt to climate change in this way, especially in systems with low connectivity.
- there is evidence of changes in the composition and structure of communities and habitats, and in the habitat requirements of some species, including some protected species, pests and disease vectors.
- ecosystem processes and services are probably also altering as a direct result of climate change. Other drivers of biodiversity loss may exacerbate the rate and extent of these alterations and their reduction would offer the possibility of adaptation strategies.
- climate change may therefore stop us reaching site, regional, national and international conservation objectives. Furthermore, ecosystem goods and services, and their socio-economic benefits, will be put increasingly at risk.

(b) actions should be taken to:

- raise awareness of the impact of climate change on biodiversity and the need for adaptation policies and programmes in Europe. Monitoring of phenological phenomena can help to raise public awareness while providing early warning of the capacity of species to adapt to climate change.



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- exploit existing knowledge to facilitate the natural dispersal of species, including habitat connectivity and ecological networks.
- review conservation targets in protected areas in the light of likely climate change impacts and the role of ecological networks for adaptation.
- implement the CBD Ecosystem Approach in developing large-scale, long-term adaptation and mitigation strategies to climate change.
- develop, and when available implement, dynamic adaptive conservation strategies integrating site and landscape/seascape-based approaches.

II – Knowledge Gaps

To support the above actions for adaptation, the participants at this meeting recommend that immediate steps are taken by relevant funding bodies, institutions and researchers to address the following gaps in knowledge:

Quantifying climate change impacts on species, habitats and ecosystems

- **improve our understanding of the effects of climate change on biodiversity as it acts through changes in the physical and chemical environments.** This requires monitoring of abiotic factors and interactions with other drivers, at a range of spatial and temporal scales. Key features in terrestrial environments include CO₂, land use and nitrogen; and in marine environments, temperature, salinity, stratification, pH, currents, upwelling, stability and wave regime events.
- **quantify and forecast the responses of genotypes, species, habitats, ecosystems, landscapes and seascapes at all relevant spatial and temporal scales.** This requires: (1) enhanced understanding of the underlying mechanisms driving, and being driven by, these processes, (2) greater knowledge of the interactions among climate change and ecosystem components, structure, function and services; (3) improved quantitative comparison of observational, experimental and modelling approaches; (4) extended open access to data.
- **improve understanding of the capacity of species and ecosystems to adapt to climate change.** This should include assessment of the sensitivity and vulnerability of species and habitats, and consequences for ecosystem functions.
- **increase research efforts to develop methods to restore, maintain or improve the ecological functioning of protected areas, landscapes and seascapes** for biodiversity conservation, and increase the coherence of Natura 2000 and other protected area networks. Develop strategies to increase ecosystem resistance and resilience.



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Understanding socio-economic aspects of adaptation strategies

- **further develop methodologies for evaluating adaptation and conservation policies.** Refine methods for taking into account the socio-economic aspects of ecosystem goods and services, including consideration of the ethical, epistemological and methodological issues inherent in valuation of the natural world, and the ways in which valuations differ across stakeholder groups, cultures, space and time.
- **improve understanding of the ways in which human factors influence the effectiveness of adaptation policies.** Research is needed to understand how governance structures and human perceptions, values and attitudes impact on policy effectiveness, and to support development of improved systems of governance, including for seas and coasts, taking into account ecosystem goods and services.

Understanding interactions between biodiversity and sectoral adaptation

- **quantify the impacts on biodiversity of existing and proposed adaptation policies** at relevant local, national and regional levels and temporal scales, through interdisciplinary and cross-sectoral research.
- **better understand and utilise the potential for biodiversity to contribute to successful adaptation to climate change across all sectors.** This includes consideration of less intensive and more natural management of land and sea in providing opportunities for adaptation.
- **improve understanding of the impacts of climate change and biodiversity loss on human health and well-being.**

Providing adaptation policy advice

- **develop and test robust headline indicators** of climate change impacts on biodiversity;
- **develop and implement means to incorporate learning from experience** through systematic, iterative evidence-based, experimental and visionary processes to review legislation, policies and practices;
- **develop methodologies to reassess and define appropriate management units** matching scales of ecological processes, in particular in the context of rapidly changing seas and coasts;
- **and further develop principles, legislation, guidelines, and practical techniques** for management of land and sea, sectoral adaptation, and spatial planning.



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III – Knowledge Transfer

The participants at this meeting are concerned that ineffective transfer of scientific knowledge is limiting the implementation of the adaptation strategies that are needed urgently to conserve biodiversity in the face of rapid climate change and therefore recommend actions are taken to:

- improve access to scientific data and information, ensuring that data is transformed into useful products for policy makers and other target audiences; using and further developing existing facilities, e.g. the CBD Clearing House Mechanism, GBIF, CORDIS, EIONET¹.
- Promote, acknowledge and implement interdisciplinary global change research agendas involving a wide range of research and stakeholder communities, to stimulate exchange of ideas at the planning and delivery stages.
- develop tools to facilitate communication within and between sectors, ministries and institutions, and especially between climate change and biodiversity research and policy communities.
- establish mechanisms for effective communication to multiple stakeholders of the impacts of climate change, including the clear presentation of risk and uncertainties, and corresponding adaptations.
- engage stakeholders by raising awareness, understanding attitudes and sharing information, including participatory approaches to data collection and the shaping of adaptation strategies.
- encourage, support and train scientists to communicate with different audiences, including through participatory approaches.
- further increase the impact of scientific research by using communications and media specialists from outside the scientific community.
- improve the processes used to identify and overcome barriers to knowledge transfer within and between all sectors and between developed and developing nations, develop effective mechanisms for knowledge transfer, and review the effectiveness of existing science-policy interfaces.

¹ Global Biodiversity Information Facility, Community Research and Development Information System, European Information and Observation Network