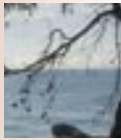
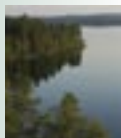


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Climate Change: The most serious threat to migratory species?

By Robert Hepworth, Executive Secretary of the UNEP Convention on Migratory Species

The effects of climate change on the behaviour of migratory species are becoming increasingly evident. Although migration is itself a flexible response to climatic and resulting environmental changes, affected species themselves are limited in their responses. They are forced to move to areas where their preferred conditions still prevail; to stay where they are and adapt; or, if they do not succeed in either of these, to go extinct.

Migratory species' changing behaviour

Wild animals are affected in many ways by a changing environment: Length, timing and location of migration have already changed for many species. In some cases, species have abandoned migration altogether. For example, as a result of higher temperatures, two migrant butterfly species, the Clouded Yellow and the Red Admiral, are now over-wintering in more northerly areas such as the United Kingdom.

In other cases, species now migrate to areas where they have not been recorded other than as occasional vagrants. The European bee-eater (listed in Appendix II of the CMS) was previously an infrequent visitor to Germany but the eye-catching bird has now become a regular breeder in several new regions. In the North Sea, rising temperatures have caused a shift in the make-up of plankton and fish communities. As a consequence, the composition of cetacean species populations has changed with a greater representation of southern-water species migrating further north. Turtles have also been seen to expand their ranges northward. The expansion of ranges can provide new opportunities for some species. However, for other species this may increase competition for food and other resources. This is likely to force some species to migrate to environments with less favourable conditions, potentially reducing their chances to survive.

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Letter from the Regional Director



Tamás Marghescu

Photo: ROFE

I am pleased to present this issue of the ROFE Newsletter with a spotlight on biodiversity and climate change. Past changes in the global climate resulted in major shifts in species ranges and a distinct reorganisation of biological communities. The present changes are happening much faster, and we are facing the challenge to draw up new management strategies for our wider landscapes in order to ensure more sustainable habitats – also for people.

Robert Hepworth, Executive Secretary of the UNEP Convention on Migratory Species, has kindly provided us with thought provoking insights into the changes in the behaviour and conditions of migratory species. These, and the many species that are on the move due to changing conditions in their current habitats, are likely to be in need of new and better connected habitats in order to survive.

IUCN ROFE is currently involved in several projects focussing on climate change impact on biodiversity, amongst other together with the European Commission Directorate-General for the Environment. We are grateful to Ladislav Miko, Director in DG Environment, for sharing with us his considerations on the measures needed to mitigate and adapt to the new species movements in Europe.

The Stern Report called climate change “the greatest and widest-ranging market failure ever seen” and warned that climate change could shrink the global economy by 20%. Global leaders are increasingly aware of the serious threats climate change also poses to health and food security. However, as Kofi Annan pointed out in his address to the UN Climate Change Conference in Nairobi 2006, the climate challenge offers real opportunities to advance development and place our societies on a more sustainable path. Indeed, the EU is taking its first steps in the proposed new energy policy and action plan that would raise the share of renewable energy by 20% and reduce both CO₂ emissions and energy use by 20% by the year 2020.

Opportunities thus also arise for the nature conservation community to forge partnerships with new stakeholders, such as energy and finance institutions, which are beginning to recognise that a balanced environment and healthy ecosystems truly are the foundations of social and economic stability.

Two landmark events for IUCN ROFE took place at the end of 2006; the conference on biodiversity in European development cooperation and the IUCN European Members' Meeting. Both events united old and new partners in nature conservation and generated visionary discussions on the future of nature in Europe and abroad. We take the opportunity here to relate the achievements of these events.

Happy reading!
Tamás



Continued from page 1...

Changes to environmental conditions

All over the world, we are witnessing changes of habitat: the permafrost is thawing and Arctic tundra is being replaced by forest, desertification is expanding in Africa, hurricanes are more frequent in the Caribbean, the Polar waters are warming up. Melting ice is affecting sea salinity and causing a rise in sea levels. These habitat changes influence the timing and availability of food and water for migratory species and can make migration itself difficult by reducing refuelling possibilities. Long-distance migrants such as shorebirds and waterfowl generally depend on a few stop-over points to feed before crossing major ecological barriers such as the Sahara desert. Increased incidence of drought here would accelerate the already high rate of expansion of desert territory and impact on the refuelling and survival possibilities of many migratory birds.

The prey species and food plants of migratory species are also affected by climate change. Migratory birds, which lay their eggs earlier than they did before, might face shortage of food, when their young hatch. Similarly, temperature changes may lead to disparities between the timing of appearance of butterflies, which depends primarily on temperature, and the quantity and quality of food plants. Cues in the wintering grounds that it is time to migrate may no longer be a good measure of conditions in the breeding grounds.

In marine ecosystems, changes in sea surface temperatures have been linked to large shifts in the distribution and abundance of plankton, affecting top predators and a number of penguin species. Rising temperatures also cause earlier break-up of sea ice in the Arctic. This will impact on Ringed Seal, Bearded Seal and Walrus populations that use ice floes for resting, moulting and giving birth. Warmer waters also offer a better environment for diseases and parasites to thrive and spread. For example, tumours in Green turtles are thought to grow faster in warmer waters and their prevalence has increased since the 1980s. Scientists have also noted that global warming may foster poisonous algal blooms and contribute to epizootics. Indeed, it appears that there has been a significant increase in mass die-offs in marine mammal populations in the last years. Other environmental factors such as nutrient deficiencies and the subsequent lack of food may have exacerbated these epizootics.

In marine turtles the sex ratio of hatchlings is temperature-dependent and higher temperatures are already leading to an increase in the female to male ratio in some places. Furthermore, some nesting beaches are seeing temperatures rise above 34°C, which is often

lethal to hatchlings. Land-seascape interactions can also have an increased negative impact on migratory species. In Queensland, Australia, increased incidences of flooding and resultant sediment run-off damages sea grass pasture and leads to reduced growth and breeding rates for Green turtles.

Challenges to the management of migratory species

Following Resolution 8.13 adopted by the Conference of the Parties in 2005, the Scientific Council has undertaken the task of assessing which migratory species face the greatest threats from climate change. For example, 84% of the bird species listed on the CMS Appendices currently suffer the consequences of climate change. The assessments will be undertaken in cooperation with other Multilateral Environmental Agreements, notably the United Nation's Framework Convention on Climate Change (UNFCCC). Range state lists are being reviewed in the light of changes of distribution as a result of climate change. New ranges may be located in states that do not have management provisions for the species and their habitats. These range states could benefit from increased international cooperation on the management and conservation of migratory species.

CMS and its associated Agreements give guidance to help develop policies to counteract the effects of climate change. Our mandate to collaborate with other Conventions in research into climate change impacts has achieved a first, tangible result: With the support of the UK Environment Ministry, UNEP/CMS has published a report on "Migratory Species and Climate Change: Impacts of a Changing Environment on Wild Animals". The research project identified a range of appropriate policy responses, such as integrated landscape management and better protection of marine ecosystems, and has pointed towards research options that will help to better understand the implications for migratory species. While animals and other life on this planet are continuously under pressure, the Convention on Migratory Species is devoted to taking on the challenge to meet the global target to reduce the loss of biodiversity by 2010.

For more information see

www.cms.int/publications/pdf/CMS_ClimateChange.pdf

Presentation made at the UNFCCC COP12 by Paola Deda, UNEP/CMS Inter-agency Liaison Officer:
rtsp://webcast.un.org/conferences/unfccc/2006/cck/unfccc061115-cckiosk_climatemigratory.rm





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News

New staff

IUCN ROfE is pleased to welcome two new staff members to the Brussels office: **Mr Bernd Bruhns** as Communications Officer and **Mr Marc De Coster** as Senior Officer for Belgium, Luxembourg and EU Relations. Bernd holds an MA in philosophy, politics and comparative religion and is undertaking an MBA in Marketing. He has worked in communications and as a project manager. Bernd will focus on the preparation of an expert workshop on marine ecosystems (see New projects) and a travel exhibition. Marc studied Agronomy, Environmental Engineering and Human Ecology. He was involved in developing nature conservation organisations in Belgium and has ample experience as a consultant for government bodies, NGOs and private companies. At ROfE, Marc's main task will be to strengthen relations with national authorities and our new Belgian and Luxembourg members.

ROfE is delighted to announce the appointment of **Mr Ramaz Gokheshvili** as the Director of the new IUCN Programme Office for the Southern Caucasus based in Tbilisi, Georgia. Ramaz is a biodiversity conservation specialist and wildlife ecologist, as well as a natural resources and environmental manager with more than 20 years' experience. He holds an MSc in Wildlife Management from the University of Idaho (USA) and a second MSc in Ecology from Tbilisi State University (Georgia).

We are also pleased to welcome **Ms L'ubomira Vavrová** to the IUCN Programme Office for South-Eastern Europe in Belgrade. L'ubomira joined SEE in December 2006 as Project Manager, replacing Maja Zitkovic. L'ubomira holds an MSc in Environmental Sciences and Nature Conservation and previously worked as a zoologist in the State Nature Conservancy of the Slovak Republic in Banska Bystrica, Slovakia.

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New website

www.europeangreenbelt.org

The European Green Belt initiative links valuable ecosystems along the former iron curtain. The projects along the course of the old east-western border symbolise the global effort for joint, cross-border activities in nature conservation and sustainable development. The newly designed website presents the three regions of the Green Belt and the specific challenges and efforts undertaken.

New projects

Facilitating adaptation to climate change

Together with the Institute for European Environmental Policy (IEEP), IUCN ROfE is taking part in a project to develop guidance for the European Commission on the links between habitat fragmentation and climate change in Europe. As species respond to climate change by shifting their geographic distributions, habitat fragmentation constitutes a significant barrier and it will be imperative to improve the permeability of the European landscape for species movement. The project explores the impacts on species and habitats in Europe and reviews measures that are being implemented by EU Member States to improve their landscape connectivity.

Countdown 2010 for marine ecosystems

In order to advance the marine protected areas agenda within the EU Member States and beyond, the German Federal Ministry for the Environment and IUCN have joined forces to host an international expert workshop in April 2007. Focus will be on elaborating recommendations for the EU on Natura 2000 in marine areas and on international marine policies. The workshop will convene about 80 leading experts on Marine Protected Areas from Member States, the European Commission, IUCN, selected UN organisations and other stakeholders. For more information, contact bernd.bruhns@iucn.org

Memorandum of understanding with CEPI

The Memorandum of Understanding (MoU) signed by IUCN ROfE and the Confederation of European Paper Industries (CEPI) constitutes a pioneering step towards increased cooperation between the two organisations. The MoU is intended to provide the organisations with a general framework for carrying out specific collaborative projects and activities. As a first step, IUCN and CEPI will work jointly on developing a best practice guide on procurement policies within the pulp and paper sector.

Climate change impacts on biodiversity

Is there a general pattern to the strategies adopted by species in the face of climate change? Can we compare the different studies showing how climate change affects biodiversity? What conclusions can be drawn to help prevent the negative effects of climate change on biodiversity? These are some of the main questions in the project "Minimisation of and Adaptation to Climate change Impacts on biodiversity" (MACIS). Leading experts from 12 institutions based in 11 countries will review the state-of-the-art science and develop enhanced models for predicting the impacts on biodiversity up to 2050. IUCN ROfE will participate in the project's policy advisory board and help to disseminate identified policy options. For more information see www.macis-project.net.

Biodiversity in European Development Cooperation

The conference “Biodiversity in European Development Cooperation” took place in September 2006 in Paris. More than 450 participants took part in the cutting-edge debate on the dual challenge of poverty reduction and biodiversity conservation. This major event was organised by IUCN and the European Commission (EC) and could not have taken place without the financial support from the EC, Belgium, Finland, France and Sweden.

Plenary sessions stimulated discussions while eight thematic workshops provided fora for participants to voice specific concerns on a subject. Thus, participants from more than 60 governments, representatives from 12 European Overseas regions and territories, a wide range of international organisations and delegates from civil society debated ways to make development aid contribute more effectively to the Millennium Development Goals and to pursue the global target to significantly reduce the rate of biodiversity loss by 2010.

Recommendations for action

The main aim of the conference was to contribute to transforming political commitments into concrete actions by developing recommendations for the EC and for the EU Member States. Participants expressed concern that the goods and services provided by ecosystems are in decline, putting at risk sustainable development and the livelihoods of the poor. The need to forge stronger links between the environment and development communities, and to move from policy design to effective implementation, was highlighted.

In the course of three days of intensive discussions, participants compiled the “Message from Paris”, which identifies four sets of challenges for common action on integrating biodiversity into EU development cooperation:

- Supporting biodiversity mainstreaming in partner countries
- Improving governance
- Strengthening instruments and policy coherence
- Recognising the important biodiversity of Overseas Countries and Territories (OCTs)

For each challenge a list of related recommendations were outlined. These recommendations include, inter alia, the integration of environmental issues into Country Strategy Papers and into national planning strategies for poverty reduction and macro-economic policy instruments, and the need for the EU to develop a coherent framework for the environment in OCTs.

Concrete commitments

During the conference, several significant commitments were made. The Finnish Minister for the Environment and the Peruvian Ministry for Agriculture signed the Countdown 2010 Declaration committing themselves to individual actions and to cooperating in a joint project (BIODAMAZ) in the complex Peruvian Amazon region.



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IUCN and the European Investment Bank (EIB) signed a historical framework for cooperation. As an EU institution the EIB is committed to the protection and improvement of the environment and to promoting mitigation measures where projects impact on nature. Under the new framework, IUCN will assist the EIB with strengthening its screening of biodiversity issues in projects it finances through joint consultation, advice and capacity building.

The Finnish EU Presidency pledged to bring the Message from Paris to the EU General Affairs and External Relations Council in December 2006. Here, the Message was welcomed and the Council recognised the important link between biodiversity and achieving poverty reduction as well as other MDGs and, perhaps more importantly, stressed the need to turn commitments into action and asked the EC and Member States to report on the implementation of the recommendations.

Finally, the forthcoming 2008 French EU Presidency will report to the IUCN World Conservation Congress on the progress made in the implementation of the Message from Paris.

For more information see www.countdown2010.net/paris2006

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Developing a new vision for nature in Europe

The European Members' Meeting in Cataluña – by Andrew Terry, IUCN ROFE

The view of nature in Europe is changing. Thanks to the tools developed through the Millennium Ecosystem Assessment, there is now a language that can be used to show how biodiversity and ecosystem integrity can be integrated with economic development. Globally, IUCN has undertaken a very important debate to develop a new model of sustainability; which better represents the central role of the environment in making social and economic development possible. Thus it comes to Europe where we must look beyond 2010 and develop our future vision for nature conservation – and for its integration into the social and economic policy objectives of European countries and of the EU institutions.

The role of IUCN

IUCN is uniquely placed to facilitate this much needed debate. IUCN's strength comes from its member organisations and in Europe these number 377 governmental and non-governmental organisations; almost one third of the global membership. At 25 million km², the European Programme region for IUCN covers the largest land mass of any IUCN programme and contains a vast diversity of natural and cultural heritage.

The central aim of the 2006 Members Meeting in Barcelona was to develop, with members, a vision for nature in Europe beyond 2010. For IUCN, this is the starting point for the development of the next European Programme for 2009–2012 and also provides the first opportunity to discuss how Europe will be represented at the World Conservation Congress, also to take place in Barcelona in 2008.

Through the kind support of the Generalitat de Cataluña, the IUCN Regional Office for Europe (ROFE) organised its second members meeting, bringing together more than 200 delegates from 37 national governments, the European Commission, five UN organisations, 88 NGOs, private companies, the IUCN global secretariat and Expert Commissions. This meeting was the first time that ROFE has been able to engage with such a wide range of representatives from the IUCN network and partners at one place.

Visions for the future

The first day of the Members Meeting was dedicated to the World Commission on Protected Areas (WCPA). Roger Crofts, vice chair for Europe, presented WCPA's new programme for Europe, which focuses

on strengthening protected areas, building capacity, and integrating governance and societal concerns. Discussions focussed on how the programme could be implemented and what the focal areas should be. It was recognised that WCPA should focus on certain key strengths, such as the refinement and implementation of the Protected Areas Management Categories and their use to support management effectiveness. It was concluded that WCPA needs to engage more strongly with the implementation and management of Natura 2000, the European Union's main tool for in situ conservation. Together with partners and members, IUCN and WCPA will also aim for better communication of the important role protected areas play within European landscapes and communities.

On the second day, participants discussed the new IUCN European Programme and visions for nature conservation in the future. Ladislav Miko, Director in DG Environment, presented his personal view of the future in which the European institutions and nature conservationists engage with the public to have a frank debate on the role the environment plays in our daily lives. What sort of lives do we want to live? This is a debate that has to use the right language and has to involve all stakeholders. This view was supported in the afternoon discussion groups where a recurring theme was the need for better mechanisms to engage with the private and public sectors.

Changing the approaches used to communicate biodiversity was also the focus of discussions surrounding the new European Programme, where participants thought that activities should be framed around the links between biodiversity and human health and development. Our health, be it mental, social or physical, is closely linked to that of our surroundings. Europeans need to choose what surroundings they want to live in, but there is a strong need to show the different options open to them and the implications of our choices. Also,





Participants in the excursion to Tarragona
© Karen Hoyer

addressing the impacts of climate change was raised as a future focus of the Programme. Europe contains a rich diversity of habitats, many of which will be dramatically affected by climate change in the coming years. An impact that is likely to be exacerbated by the continued development of infrastructure in Europe and subsequent habitat fragmentation.

These messages were reiterated in the many side events that took place during the meeting. The side events highlighted important initiatives and activities taking place and included presentations on biodiversity in Europe's overseas territories, the European Green Belt, nature conservation in Cataluña, Mediterranean mountain habitats, the Hoge Kempen National Park in Belgium, the European Habitats Forum and the Delos initiative for spiritual areas in Europe.

No business on a dead planet

One of the strong mechanisms that can be used to communicate biodiversity issues is the Countdown 2010, which continues to engage more and more partners from different backgrounds. The meeting saw 24 organisations join the initiative and each of them pledged to undertake a number of activities to support the 2010 target. Presenters on Countdown 2010 activities included Mark Held from the Association of Outdoor Groups, which represents all the major manufacturers of outdoors equipment. Mark discussed why it was important for these businesses to support nature conservation. Not only is their business model reliant on a healthy environment and a positive social attitude to being outdoors, but they are generally people who are ethically motivated by the state of the environment. Quoting David Brower, Mark underlined that "There is no business to be done on a dead planet".

Touching ground

To give participants an occasion to take home new ideas, training sessions were arranged on different ways of engaging with nature conservation, including media relations; fundraising within the EU; and project development. Each session provided examples of innovative approaches to the successful development of projects and

the communication of messages that are related to socially relevant issues.

Finally, to allow participants to ruminate over the many discussions that took place during the preceding three days and see some active conservation efforts, an excursion was organised with the Catalan NGO Depana to Punta de la Móra. This is one of the few places on the Spanish coast where a significant area of Mediterranean pine forest can still be found. The area, which is under private ownership, was never developed and the EU LIFE Programme has helped safeguard this characteristic Mediterranean coastal and marine habitat. The site is a strong example of the success that can follow good communication between conservationists, local landowners, and regional and national authorities.

During the visit, Mr Joan Miquel Nadal i Malé, the Mayor of Tarragona Municipality, signed the Countdown 2010 Declaration on behalf of the Municipality. Participants then visited the newly opened marine biodiversity information centre, which was established thanks to the collaboration between the Municipality, the Tarragona port authority, a local scuba-divers club and Depana.

The three days of the meeting generated many discussions and ideas. The ROfe Secretariat will build upon the strong response from participants to propose a new European Programme that will be circulated amongst members for comment during 2007. This Programme will outline activities to implement a new vision for nature conservation in a Europe where healthy citizens thrive in equally healthy environments.

IUCN would like to cordially thank the City of Barcelona and the Region of Cataluña for their generous support and hospitality in hosting the European Members Meeting. We look forward to visiting Barcelona again during the 4th World Conservation Congress in 2008.

Melting ice and dying reefs

Interview with Alfred E.R. Jakobsen, Deputy Minister for Health and Environment of Greenland, and Georges Handerson, Minister for Sustainable Development of French Polynesia by Erik van Zadelhof, ROFE



Alfred E.R. Jakobsen & Georges Handerson

Mr. Jakobsen, according to the UNFCCC, Arctic air temperatures increased by about 5°C during the 20th century – ten times faster than the global mean surface temperature. What has been the effect on Greenland’s environment so far?

AERJ: We are currently experiencing glaciers melting and retreating at a rate which has not been observed before. Normally, the glaciers grow in thickness during winter as ice is added and thus balances out the loss from the summer period, but now we are experiencing warmer winters and consequently the glaciers have started to retreat. The generally warmer weather also means that winter sea ice is thinner, arrives later and breaks up early. Permafrost is thawing and in the summer, we are experiencing both droughts and heavy rains.

Climate Change scenarios predict a further increase in global mean temperatures of 1–6°C in the next 90 years, potentially leading to a 0.5–1m rise in global sea level, and increased frequency of extreme weather events. What are the likely consequences of these changes for your natural environment and unique biodiversity?

GH: The rise of sea level and temperature is of major concern for our islands, for both the population and our biodiversity. Drastic changes will occur on the coral reefs, which are expected to suffer bleaching due to warmer waters. This will produce a negative effect on the entire lagoon biodiversity and, for our people; it would in particular have a negative impact on the fishing opportunities. The weather

changes will also affect the terrestrial part of the islands and might lead to an increased loss of biodiversity.

AERJ: Of course these are only predictions, but still, they really tell us that something is happening and more serious events are forthcoming. It is expected that of all the regions in the world, the Arctic region will experience the most dramatic impact from climate change. Local and regional fauna and flora are already affected. For example, the polar bears are negatively affected by long periods of new and thin sea-ice that makes it more difficult for them to hunt. Invasive alien species may gain the advantage over local ones. In addition, a natural spreading of species, previously unable to thrive in Greenland may also be seen.

How will this affect your economy, culture and way of living?

AERJ: We in Greenland are socio-economically and culturally extremely attuned to our environment and highly dependent on it. Greenland is a modern society with, for example, a high-tech fishing industry, but still many families along the coast live from subsistence hunting and fishing. With climate change disturbing the natural cycles of our environment, it becomes more difficult to continue the subsistence way of life and we risk that more people will become dependent on social welfare assistance. However, warmer weather is also increasing options for farming and mineral exploitation in the Southern part of Greenland.

© AER Jakobsen



In the long run, if the ice sheet of the North Pole melts totally, it would open up new shipping routes between the European, Asian and American markets. New opportunities for exploration of mineral and other resources would then also emerge.

GH: With the sea level rising, the security of many Polynesians will be affected. People may be forced to move and we will not know where we are going to be able to live safely. Our islands are small already and if they shrink even more how will we be able to sustain an economy that can support our people?

On a wider scale, the Overseas Countries and Territories' (OCTs) extraordinary biodiversity is a major world heritage, and are also the foundation for deep-rooted cultures, and development and research opportunities. Which measures do you foresee in order to foster adaptability to climate change, for your environments and cultures?

GH: French Polynesia will particularly be affected by the consequences of global climate change even though its contribution to the causes is very low. We promote sustainable development, encouraging environmentally safe activities and protecting our biodiversity. We develop regional cooperation in order to share knowledge and strategies and call on the international community to take actions to limit all the causes of global climate change.

AERJ: OCTs have recently joined forces to establish our own association, OCTA. Through closer cooperation, these small islands spread around the globe face a very interesting and challenging situation in ensuring sustainable use of our unique biodiversities and other resources. Another example could be developing internet based homepages to promote our objectives and to develop cooperative programmes, for instance for e-learning.

Which initiatives are you taking to make world leaders and global actors understand the urgency of your situation and take action?

AERJ: In 2005, Greenland together with Denmark hosted an informal conference on climate change attended by more than 20 environmental ministers from around the world. One of the aims was to allow the ministers to see, with their own eyes, that the glaciers are melting and see that the industrial countries have to undertake more powerful measures to limit their CO₂ emissions. Greenland is investing in hydroelectric power to become more independent from oil-based power supplies. We support the Kyoto Protocol and want the Protocol to continue beyond 2012.

GH: I take any international occasion to explain our situation and the limited means we have to directly affect or reverse the situation, as during the IUCN conference on Biodiversity in European Development Cooperation in Paris in September 2006. We do need a global awakening on the subject. And I warmly thank you for giving me this opportunity right now.

What are the most urgent steps you would like to see the EU, the Member States, and perhaps other actors, take?

GH: I would like the European Union to acknowledge the extraordinary biodiversity and ecosystem quality that OCTs and south Pacific islands represent. French Polynesia on its own has more endemic species than all the EU countries put together!

I hope that the message from Paris will be heard and that the EU will develop a coherent framework to promote sustainable management of the important biodiversity areas in the OCTs, and also encourage joint efforts with Outermost Regions including adequate funding mechanisms. Furthermore, it would be necessary to increase research on the sea level rising and its consequences within the Pacific. Since 2006, our government supports a study on the economic effects



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on the sea level rising in Tahiti in collaboration with the University of Sorbonne. It's a beginning, but we need more research: for the Pacific islands, this is an emergency!

AERJ: That the EU Member States continue to limit their CO₂ emissions; that they continue to develop new technologies with much less CO₂ emissions, and that they continue their efforts to get China, the USA and other countries who have not yet ratified the Kyoto Protocol to join the parties who have ratified the Protocol.



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In this issue, we focus on the impacts of climate change on terrestrial biodiversity. There is strong evidence that climate change is affecting species distributions (Parmesan and Yohe, 2003; Thomas *et al.*, 2004), and that this impact will be exacerbated in the future (Araújo and Rahbek, 2006). We are also discovering that climates have varied to greater extremes in the past; and at faster rates than previously thought. Past data is providing insight into the possible ways in which species may respond to current anthropogenically driven climate change. The articles discussed here focus on species and habitat-level responses and the tools used to predict the likely effects of climate on species distributions. Modelling the ways in which species may respond to climate-driven changes has gained popularity and results have been widely communicated (e.g. Thomas *et al.*, 2004). But we must be careful in the use and interpretation of such results, especially for the formulation of conservation priorities and plans (Araújo and Rahbek, 2006).

Species Response to Climate Change: shifting envelopes

There is considerable interest in predicting the likely responses of species in the short to medium-term future and identifying those taxonomic groups that are vulnerable to climate change (Araújo and Rahbek, 2006). The most commonly used approach is to identify a bio-climatic envelope for a species using a combination of current climatic and species range data, which are then compared with a future envelope based on predicted conditions (Araújo and New, 2006). The extent of overlap between the two envelopes gives an indication of the vulnerability of species to climate change. This approach is easy to communicate (eg. Thomas *et al.*, 2004) and is pragmatic for utilising complex datasets.

The approach is generic and encompasses a number of different model types and assumptions. Invariably the choice of model is made for pragmatic reasons (Araújo and New, 2006). Criticisms of the approach focus on features inherent to the models and their inability to capture important ecological components that may affect species distributions (Pearson *et al.*, 2006). Examples of such components are differing dispersal ability between individuals, local adaptations and the effects of ecosystem dynamics. A comparison of the use of different models on the same dataset found considerable variation in the predictions made, ranging from a 92% loss to a 322% gain in territory (Pearson *et al.*, 2006). There is also the critical question of whether predictions of current species distributions can deliver sound predictions of future distributions (Araújo and Rahbek, 2006).

A number of different approaches are being developed to address these concerns. Araújo and New (2006) propose the development of “ensemble forecasting”, where many different forecasts are made for a system using a range of starting conditions, model parameters and model classes. The choice of best performing model is based on the range of model outputs expressed. Other approaches include the use of “hindcasting”, where current species distribution predictions are validated on fossil record data and on regional tests of distribution predictions on species from other regions (discussed in Araújo and Rahbek, 2006). It is clear that the current use of climate envelope models has strongly indicated some expected effects of climate change, but we need to move beyond this stage to models that test the predictions and allow for a clearer understanding of likely species response.

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Land Use and Climate Change

In Europe, the dominant land use is agriculture and therefore farmed areas are very important for European biodiversity. Across the continent the main concerns for agricultural areas are the intensification of farming or land abandonment in marginal areas. Biodiversity indicators clearly show the negative impacts of intensification on species. The decisions associated with the management of farmed areas are generally linked to the profitability of the use; low profits lead to abandonment and high profits can lead to intensification and the conversion of new land to agriculture (Audsley *et al.*, 2006; Berry *et al.*, 2006). The choices concerning land use are made by farmers who are responding to socio-economic conditions, subsidy structures and environmental conditions. The main environmental conditions will be climate and soil condition. Therefore a number of questions can be asked of the impending interaction between land-use change and climate change for species and natural resource management in Europe. To what pressures are farmers and biodiversity most vulnerable and how does this vulnerability change under predicted future conditions? These issues were addressed in the ACCELERATES project (funded by the European Commission's DG Research), which aimed to integrate models predicting climate change with land use, soil biology and species responses.

Audsley *et al.* (2006) used four socio-economic scenarios and two climate scenarios as ways of describing possible future conditions in 2050. Although there was considerable variation between the scenarios, they predicted strong increases in crop suitability in northern latitudes and higher altitudes and decreases in southern Europe, especially for spring-sown crops. This indicated that policy

challenges will come in northern latitudes on land-use options in response to ecological and societal needs. Generally though, the largest differences for farmers were not due to climate change, but to socio-economic conditions. The results were most strongly expressed in the border regions of Europe, rather than in central Europe. It is also likely that the most affected areas are marginal regions where land abandonment is a constant threat and biodiversity is reliant on extensive forms of land management. The study showed considerable variation in predictions made for different regions and so there is need to continue to refine models that integrate land use with likely climate conditions to identify possible options for rural development and conservation strategies in the future.

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For more information see: www.geo.ucl.ac.be/accelerates/





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Biodiversity protection and climate change adaptation: two sides of the same coin

By Ladislav Miko, Director of the European Commission's Directorate for Protecting the Natural Environment, DG Environment

As Europe experiences one of the mildest winters on record, both human society and the natural environment have to adapt to the effects of climate change. It is clear that human society would prefer to have no significant (negative) changes and to keep unavoidable changes as small as possible. In the context of biodiversity, adaptation entails allowing nature at all levels – from genes to ecosystems – to use existing natural adaptation mechanisms. Allowing this can, in turn, also reduce the impacts on human society.

Species' response to climate change

The most obvious responses to climate change can be observed in alterations to species distributions and the timing of biological events such as migration. However, less obvious and more subtle changes are happening all around us.

Ecosystems are composed of large numbers of species with complex mutual relationships. Some of the species are quite tolerant to changes in conditions, others are more sensitive. As a result of climate change, species may fall outside of their tolerance range, and thus disappear. If we are indifferent to these changes, we will end up with highly simplified and homogenous ecosystems. "Weedy" species will dominate our world and we will lose what is different, specific and therefore characteristic for each particular territory – our nature will lose its identity. This will of course affect the quality and quantity of the goods and services delivered by our ecosystems, although at present it is not possible to quantify the extent of these impacts.

It is important to keep in mind, that it is not only species that are relevant in adaptation to climate change. There is a direct link to many other issues such as, for example, soil erosion and degradation, loss of carbon captured in ecosystems, changes in natural pools of other nutrients, water retention capacity and related water regime, quality of water and the severity of weather events.

The accumulated additional stress will have a profound effect upon our natural ecosystems and what our world will look like. Where possible, we need to promote rather than undermine the natural

resilience of the ecosystems upon which we depend, in order to protect our natural capital and ensure the continued flow of ecosystem goods and services. We need to allow natural adaptation mechanisms to remain flexible, to keep our environment in balance, and at the same time contribute significantly to mitigating effects of climate change on human societies.

Space for people and nature

The principal requirement for ensuring the continued flow of ecosystem services is to safeguard the natural and semi natural ecosystems, which are primarily responsible for delivering these services. In other words, we need space for people on the planet, but at the same time we need space for nature. Space for nature could be found at different scales, and we should employ all of them. We should protect the remaining fragments of natural or semi-natural ecosystems in order to create refuges for species and we need to protect larger areas to allow room for natural or semi-natural processes.

In the EU we have developed a system of protected areas termed Natura 2000. Natura 2000 has to take into account that much of our existing habitats and landscapes have been shaped by human use and often depend on continued human use to sustain their biodiversity. Human exploitation of natural areas may thus be carried out in a way, which does not damage, or even enhances, the characteristics of a site or its biodiversity. However, some human activities are harmful to biodiversity. We should strive to minimise the negative impacts, especially in those cases where the carrying capacity of ecosystems is reached.

Due to the differing requirements of species and their role in maintaining the ability of ecosystems to function and be resilient to future change; the individual areas in our natural infrastructure should cover at least the minimum area for those species to survive and/or to uphold a given habitat. If the size is smaller than the critical minimum, the ecosystem will degrade and/or protected or endangered species will disappear. The Natura 2000 network encompasses both large

and small areas that play an equally important role in maintaining a broad variability of species and genomes, which in the long term will allow for the development of a wider range of adaptation options.

The path of evolution

The characteristics of species are the result of interactions between their genes and the environment. Thus changing environmental conditions drive evolutionary processes. Across the whole range of a species, different populations will show adaptations to local conditions. Some species can become particularly well adapted to a specific set of conditions, whereas others are able to thrive in a wide range of conditions. What we receive as ecosystem services in any particular area is the result of evolutionary processes and the local adaptations of these specialist and generalist species. Our approach to land use has acted to homogenise the landscape, thus reducing the variation open to species. We are witnessing a mass decline of species as a result, especially amongst those specialised to particular conditions. Climate change is likely to impose a major additional impact on evolutionary processes over the next century. Of particular concern is how this impact interacts with the fragmentation of habitats and homogenisation of landscapes. If we only allow evolution to work in fragmented, narrowly defined areas this is likely to result in ever more homogenised and simplified ecosystems, which may still deliver ecosystem services, but of limited variety and quality.

Facing the challenge

We are not powerless in the face of climate change and its effect on ecosystems. We can work with natural processes in order to conserve resilience. When species have the opportunity to migrate, they may move along climatic gradients and find the area best fitting their needs. Displaced species fulfilling a certain function in a particular locality may be replaced by ecologically equivalent species, which may immigrate from elsewhere. For both of these processes, we need to ensure connectivity of elements of the natural infrastructure – creating a really interconnected network instead of a patchwork of rather isolated parts. This means we need to address biodiversity issues at the broader landscape and seascape levels. We need to tackle the issues of fragmentation and artificial barriers by creating biological corridors, temporal refuges, or by using the countryside in a way that will allow the species to pass through. Only by putting elements of space and connectivity together, will we increase the resilience of natural ecosystems leading to a natural mitigation of climate change effects on human society. Resilient natural ecosystems are human societies' best defence against the negative impacts of climate change.

Clearly, climate change will not only have negative impacts on ecosystems; some may expand and even increase their biodiversity as the species composition changes. But when we view the European landscape as a whole and look at the relative changes that are taking place, we can see that the maintenance of biodiversity requires sufficient space, connectivity and variation. I believe that the answer to our future challenges lies in better land-use planning and decision-making and that the full implementation of the Action Plan, published in May 2006 as part of the European Commission Communication on Biodiversity, along with achieving our immediate target of halting the loss of biodiversity in the EU by 2010, can contribute significantly to solving some of the problems caused by climate change.



Species extinction and the Kyoto Protocol

By Martin Hiller, WWF Climate Change Programme

The rate of species extinction has already increased by a thousand times compared to the natural rate. Now our global civilization has come up with climate change to hit Earth in all corners at the same time. Recent scientific studies show that up to a quarter of all land-based species could become extinct halfway through this century if climate change goes unchecked for much longer. The polar bear's rating on the Red Lists has worsened, the pika in North America is disappearing, and the golden toad of Costa Rica is already lost. How many more must it take?

Rising temperatures...

In 2006, staff from 22 WWF priority ecoregions worldwide came together to discuss possible buffers to climate change impacts. The task is daunting. All WWF's priority ecoregions are selected because of their outstanding natural value, their high number of rare species, and their special habitats. All the regions are already under massive pressure from – legal and illegal – human activities. And now climate change comes in on top, and starts to hit in earnest. Annual global average temperatures are on the move – up!

An increase of 0.8°C over 200 years might seem small – but not when you consider that this increase is in the annual global average temperature. The extremes are in fact changing more rapidly and more radically than the development of the average temperature shows. In particular, extreme weather events occur more frequently, dislodging species, disrupting food chains and disintegrating habitats.

...have dire consequences for ecosystems

Work in the Meso-American reef illustrates the point very well. The reef, one of the largest and most biodiversity-rich habitats on Earth, is already heavily threatened by illegal fishing, dynamite fishing, run-off from farming and settlements, and tourism, to name just some factors. Now warming conditions pose a tremendous additional threat to the corals. In 2005, the worst coral bleaching event ever to take place in the Caribbean Sea was recorded. Masses of old coral stocks, which existed already when Columbus cruised on these waters, died within a few months.

But local climate change is having a major effect on nature across the globe. Species in mountain areas are moving to higher altitudes, being replaced by other, more heat-resistant ones. In rivers or plains, species try to move north. Estimates assess that thousands of species are already on the move.

One thing became absolutely clear at the WWF workshop: while there are ways to improve the resilience of nature to global warming, the flexibility of ecoregions is low. According to the best available knowledge, things will get totally out of hand if we cross the barrier of a 2°C increase in global average temperatures.



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Keys to the future

During the last 200 years, we pushed global average temperature up by 0.8°C. Most of this rise took place in the last 40 years. To protect our ecoregions, we need to cut CO₂ emissions: We need to use alternatives to fossil fuels. These exist – we just have to do it!

WWF's new vision on energy production and use focuses on how the world can develop and increase its economic and social welfare, while stopping climate change. The Kyoto Protocol was a good start. Its second phase, starting in 2012, must, however, turn commitments from the 1990s into real emission reductions. The negotiations are ongoing and WWF pushes hard to influence them.

Energy is the world's biggest political and business issue and economic alternatives to fossil fuels need a strong political commitment to make private investments worthwhile. Without this commitment and these investments, the flexibility of our ecoregions will reach its limits.

Species conservation is truly becoming a fight for life and death on this planet.

IUCN Calendar of Events Jan. - March 2007

The meetings listed below are events organised or sponsored by IUCN, or in which IUCN is participating.

January

- 11-12 Geneva, Switzerland**
Mobilising Wood Resources
www.unece.org/trade/timber/workshops/2007/wmw/mobilisingwood.htm
- 17-19 Geneva, Switzerland**
First meeting of the Parties to the Protocol on Water and Health
www.unece.org/env/water/whmop1/info.htm
- 18-20 Courchevel, France**
Forum International pour le Développement Durable
www.planetworkshops.org/
- 22-25 Lima, Peru**
Meeting of the Group of Technical Experts on an Internationally Recognized Certificate of Origin/Source/Legal Provenance
Organised by the Convention on Biological Diversity
www.biodiv.org/doc/meeting.aspx?mtg=ABSGTE-01
- 26-27 Gulfport, Florida, United States of America**
9th International Wildlife Law Conference
www.internationalwildlifelaw.org/programs2.shtml
- 31-1 Feb Geneva, Switzerland**
Exploratory Dialogue on Promoting Sustainable Land Management through Trade
www.global-mechanism.org/news--events/events/promoting-slm-through-trade-workshop/

February

- 5-9 Nairobi, Kenya**
24th Session of the UNEP Governing Council/Global Ministerial Environment Forum
www.unep.org/gc/gc24/
- 12-14 Berlin, Germany**
International Symposium: Time to Adapt – Climate Change and the European Water Dimension
www.climate-water-adaptation-berlin2007.org/contact.htm
- 12-15 Gland, Switzerland**
35th Ramsar Standing Committee
www.ramsar.org/sc/35/key_sc35_agenda_papers.htm
- 15-16 Oisterwijk, the Netherlands**
European Conference “European Regions as Champions for Biodiversity 2010”
Europe meets Brabant, Brabant meets Europe.
www.biodiversitybrabant.nl/users/biodiversity/index.php?pagina_id=94
- 27 Brussels, Belgium**
Saving Biodiversity: Making Natura 2000 work
www.eeb.org/events/Index.htm



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March

- 1 International Polar Year**
www.ipy.org
- 5-7 Alta, Norway**
Borealis Conference 2007
www.hifm.no/borealis
- 14-16 Stuttgart, Germany**
Second Workshop on All Taxa Biodiversity Inventories and Monitoring
www.e-taxonomy.eu/news.php?optimurl=second-workshop-on-ATBI-M
- 21-24 Seville, Spain**
5th European Conference on Sustainable Cities & Towns
www.sevilla2007.org/

Useful event calendar links:

Agenda of the EU institutions
http://europa.eu/press_room/agenda/index_en.htm
European Centre for Nature Conservation (ECNC)
www.ecnc.nl/Main/Events_421.html
European Environment Agency (EEA)
www.eea.europa.eu/Events/Calendar/
Natura 2000 Green Days
www.eurosite.org/bin/events/index.php?t=c
Sustainable Development Gateway
www.sdgateway.net/events/
United Nations Environment Programme (UNEP)
www.unep.org/Calendar/
United Nations Forum on Forests
www.un.org/esa/forests/calendar.html

IUCN's vision

A just world that values and conserves nature

IUCN's mission

To influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.

ROfE's mission

To foster and fortify a European network of excellence in environmental research, policy and best practice, with the aim to:

1. Contribute to IUCN's global mission
2. Support the integration of biodiversity conservation into economic development
3. Support innovative initiatives for the multi functional, sustainable use of natural resources

ROfE's structure

Regional Office for Europe (ROfE) is a branch of the IUCN global network. We along with offices and commissions around the world link back to the President, Director General and Council of IUCN. For a history of IUCN and an explanation of the global structure please visit www.iucn.org

ROfE is comprised of four IUCN offices located in Brussels, Warsaw, Belgrade and Moscow. The head office, located in Brussels, is a meeting point where the IUCN Programme Office for Central Europe in Warsaw, the IUCN Programme Office for the Commonwealth of Independent States in Moscow and the IUCN Programme Office for South-Eastern Europe in Belgrade can disseminate information and strategies. Together as ROfE we strive to meet our goals for a sustainable Europe by utilizing local expertise and the strength of the global IUCN network.

ROfE Regional Office for Europe

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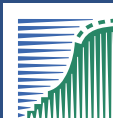
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