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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Group of Experts on Biodiversity and Climate Change

Seville (Spain), 13-15 March 2008

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REPORT

Document
prepared by
the Directorate of Culture and Cultural and Natural Heritage

The Standing Committee is invited to:

1. Take note of the report of the meeting;
2. Thank the Migres Foundation and the regional government of Andalucía for the extremely efficient preparation of the meeting and the excellent hospitality.

CONTENTS

1. Opening of the meeting by the Chair

Ms Caroline Cowan, of Natural England, UK, welcomed participants at the second meeting of the Group of Experts on Biodiversity and Climate Change (a list of participants is included in appendix 1). She highlighted the mandate of the Group and summarised the work carried out since its creation.

2. Address by Ms Fuensanta Coves, *Consejera de medio ambiente de la Junta de Andalucia*

Ms Fuensanta Coves, Head of the Environmental Department of the Regional Government of Andalusia, welcomed participants to Seville and Andalusia, and formally opened the meeting with an address to the Group of Experts where she stressed the importance of the issue of climate change and its impacts on biodiversity. Ms Coves referred to the regional climate change strategy for Andalusia adopted in 2002 and including 39 specific measures, making it the first region in Spain to have taken such action. She also mentioned the important role played by newly-created foundations to co-ordinate actions and design effective strategies and policies on environmental issues, as well as raising the awareness of citizens. Ms Coves thanked the Migres Foundation for organising this type of event and wished for a very fruitful meeting with specific proposals addressed to decision-makers.

3. Adoption of the Agenda

The Secretariat explained that the representatives from the CBD and CMS had sent their apologies as they had been unable to travel to Seville so items 5.a and 5.b would be removed from the agenda. However, there were two new presentations to be added: from GBIF (new item 5.d) and *Il Nibbio* Foundation (new item 14). The agenda was adopted with these changes, as it appears in appendix 2 to this report.

4. Introduction by the Secretariat

The Secretariat briefly recalled the mandate of the Group of Experts to provide information and guidance to Bern Convention Parties on climate change and biodiversity. She mentioned efforts undertaken to ensure exchange of information and co-ordination with other biodiversity conventions and international organisations working on this issue, as well as with other institutions of the Council of Europe that are also active on climate change issues, such as the Parliamentary Assembly and the Congress of Local and Regional Authorities. She further stressed the need to keep links with other Groups of Experts set up under the Bern Convention so the outcome of this work is truly synergistic.

The Secretariat summarised the objectives of the meeting: i) to continue exchange information on climate change impacts on biodiversity with other conventions, amongst Contracting Parties, with other CoE institutions, and with NGOs; ii) to discuss a number of draft reports to review available information on impacts of climate change on Bern Convention species and habitats; and iii) to agree on next steps for the future work of this Group of Experts, including links with other Groups under the Bern Convention.

5. Updates on biodiversity/climate change work in other for a

Mr Atef Ouerghi, from UNEP's Regional Activity Centre for Specially Protected Areas (RAC/SPA) based in Tunisia, informed the Group of Experts of a number of studies prepared in the 1990s on the implications of climate change on Mediterranean coastal zones, and including aquatic and marine ecosystems. He also mentioned the Tunis Declaration for international solidarity in the face of climate change, adopted in November 2007 at an international conference on climate change strategies for African and the Mediterranean region. Mr Ouerghi reported that the 15th meeting of the Parties to the Barcelona Convention, held in January 2008, agreed to identify – by 2011- the coastal and marine species and habitats most sensitive to the changes that may result from the scenarios described by the Intergovernmental Panel on Climate Change (IPCC) and to promote measures for the establishment of a Mediterranean network of coastal and marine protected areas, by 2012. The Parties to the Barcelona Convention also agreed to prepare a report on the situation of biodiversity in the

Mediterranean and the observed impact of climate change, to be addressed to both CBD and Barcelona meetings of Parties.

Ms Karin Zaunberger, from the European Commission (DG Environment), presented the EU perspective on biodiversity and climate change, focusing on progress in the implementation of the 2006 Commission Communication and Action Plan as well as research projects funded by the EU. Ms Zaunberger informed the Group of Experts of the forthcoming White Paper on "Adapting to Climate Change in Europe – Towards a framework for EU action", expected for autumn 2008, and where biodiversity and ecosystems will be both a cross-cutting and a sectoral issue. The White Paper will cover both adaptation of biodiversity and ecosystems in the face of climate change, as well as the role of biodiversity and ecosystems as adaptation instruments. In the medium-term, the EU plans to produce a Strategy Paper on Biodiversity and Climate Change to include policy instruments to protect biodiversity under changing conditions, and ensure that climate change policies do not harm biodiversity. The EU's objective is to produce a comprehensive framework that recognises the relationship between climate change and biodiversity, and to ensure that other EU policies also contribute to conservation and sustainable use of biodiversity.

Mr Snorri Baldursson, Chair of the SEBI 2010 Expert Group on "Indicators of impact of climate change on biodiversity", informed the Group of the work carried out under the SEBI 2010 process to develop interlinkages across the 26 indicators agreed by the EU as well as to further refine the indicator on climate change and biodiversity. The Expert Group held its first meeting in February 2008 to review existing indicators on this issue from various sources, which were deemed insufficient. The Group will next meet in October 2008 to investigate if an existing indicator on the impact of climate change on European common bird populations can be expanded to other species such as butterflies. They will also consider the development of alpine plant indicators and other potential indicators regarding common plants and species within protected areas. This process is expected to be concluded in 2009, with the selection of one headline indicator on climate change and biodiversity, and two or three sub-indicators.

Mr Francisco Pando, in charge of the Spanish node of the Global Biodiversity Information Facility (GBIF), focused his presentation on the mobilisation of biodiversity data and GBIF's contribution to the climate challenge. Mr Pando gave a brief overview GBIF, an international organisation set up in 2001, to make global biodiversity data "freely and universally available via the Internet", and also to "share primary scientific biodiversity data for science, society and a sustainable future". GBIF includes 45 countries and 38 international organisations, holding 1,663 databases with a total of 145,667,054 records (their portal is http://data.gbif.org). Mr Pando referred to the need to put GBIF's mediated biodiversity data to good use in the area of climate change and biodiversity, including using GBIF data to measure the impact of climate change on species distributions, and made an open invitation for collaboration with the Bern Convention and its Groups of Experts.

6. Brief national reports informing on activities and initiatives on biodiversity and climate change

National reports from Albania, Bulgaria, the Czech Republic, Denmark, the European Commission, France, Germany, Hungary, Iceland, Latvia, Norway, Spain, Sweden, Tunisia, Turkey, and the United Kingdom were presented (they are annexed to this report as appendix 3). The Secretariat added that the Republics of Serbia and Armenia had also submitted national reports, which are included in the appendix. Serbia will become the 46th Contracting Party of the Bern Convention on 1 April 2008, and Armenia is completing its ratification procedure and also expected to become a Party this year.

The presentations showed that Parties are very active concerning implementation of the UN Framework Convention on Climate Change (UNFCCC) but they are also addressing the linkages between biodiversity and climate change, many with a focus on forest ecosystems. The bulk of Parties' activities and initiatives on this issue relate to monitoring the impacts of climate change on biodiversity and research projects to improve knowledge about the relationship between biodiversity and a changing climate. Some Parties are also developing activities on communication and information about climate change and biodiversity. In the policy field, a number of States have

developed national adaptation strategies and others are currently in the process of completing them. For those Parties which already have adaptation strategies, all of them include biodiversity components or elements to a bigger or lesser extent

7. Review of available information on direct and indirect impacts of climate change on biodiversity and identification of most vulnerable species and habitats

Ms Pamela Berry, Senior Research Fellow at the Environmental Change Institute (Oxford University Centre for the Environment) gave a presentation highlighting the main issues covered in her draft report ("Climate change and the vulnerability of Bern convention species and habitats", T-PVS/Inf (2008) 6, of 26 February 2008), which had been made available to meeting participants prior to the meeting. Ms Berry focused her presentation on the concept of vulnerability, as defined by the IPCC, and its application to the Bern Convention. She raised the question of the future use of her report whether as a communication tool or as information leading to action by Contracting Parties. Ms Berry informed the Group of Experts that IUCN is working on a vulnerability assessment and the need of more data to assess vulnerability.

The members of the Group of Experts welcomed the report and stressed the need to get the input of other Groups of Experts under the Bern Convention to prioritise or select a short list with the most critical species/habitats on which concentrate future action, as well as combine efforts with the work on Natura 2000 carried out by the EU, and IUCN's initiative.

8. Climate change and invasive alien species

Ms Laura Capdevila–Argüelles, from the Specialist Group in Biological Invasions (GEIB), presented her draft report "A perspective on climate change and invasive alien species" [T-PVS/Inf (2008) 5, of 26 February 2008], also distributed to participants ahead of the meeting. Ms Capdevila–Argüelles stressed the fact that climate change is one of a number of global changes whose influence is accelerating the spread of these harmful species. She cautiously warned that there is increasing evidence that climate change will interfere with processes underlying biological invasion but that it would be unwise to make specific predictions with the current level of knowledge. Ms Capdevila–Argüelles recommended to focus attention on every aspect that influences the invasion process and its interactions with global change, as climate change has the potential to modify the impact of IAS by affecting their sources, pathways and destinations. She further explained that although species traits are not a determining factor in order to predict if one species has the potential to be a good invader or not, it is possible to detect some traits that could play and important role in "predicting" future invasive success. Two of her key conclusions were that the identification of high-risk potential invasive species, their early detection and rapid response will enhance effective management, and the fact that biosecurity strategies will also need to increasingly incorporate climate change projections into risk management assessments of IAS.

The discussion focused on a number of critical issues, such as the role of ecological connectivity and how to manage it to reduce risk of invasion; the definition of native species and the need to review the relevant criteria; and whether climate change will change the current ratio of 1% of native species becoming invasive.

9. Brief presentations of climate change work at the Council of Europe

Ms Manuela de Melo, Vice-Chair of the Sub-Committee on Sustainable Development of the Parliamentary Assembly of the Council of Europe, highlighted the environmental work of the Council of Europe in line with the priorities of the 2005 Warsaw Summit. She informed the Group of Experts that the new president of the Parliamentary Assembly, Mr Lluis Maria de Puig, has given the Assembly a new impetus on environment and sustainable development issues, including a link between human rights and climate change. She further informed that currently nine reports in preparation in the Environment Committee are related to these issues. Ms Melo called for co-operation between decision-makers and groups of experts working within the same organisation so that all can benefit from the diversity of views and approaches.

Mr Willy Borsus, Member of the Committee on Sustainable Development of the Congress of Local and Regional Authorities of the Council of Europe, and rapporteur on 'Biodiversity policies for urban areas' presented to the Group of Experts the priorities for the Congress, which include the sustainable energy consumption of regional and local authorities and the need to strengthen the capacity of local authorities in the face of climate change. Mr Borsus further presented the report he prepared on urban biodiversity, adopted by his Committee and now submitted to the next session of the Congress. He stressed the negative trends in both rural and urban biodiversity and the need to act, including the need to review the status of urban biodiversity and to design indicators to monitor developments and quantify the impact of measures taken. Mr Borsus called for specific measures to strengthen cities as areas of biodiversity, for which integration of nature conservation concerns into land use planning is very important.

10. Climatic change and the conservation of migratory birds in Europe: Identifying effects and conservation priorities

Mr Keith Bildstein, Scientific Director of the Hawk Mountain Sanctuary in Pennsylvania, and co-author of the report "Climatic change and the conservation of migratory birds in Europe: identifying effects and conservation priorities" [T-PVS/Inf (2008) 1 rev, of 26 February 2008], presented it to the Group of Experts. He stressed the fact that birds of prey are good biodiversity indicators, even if not all of them are migratory. Mr Bildstein referred to the risks that climate change present to long-distance migrations as many species are migrating earlier in spring to Europe and staying here longer, adding that the phenomenon of migration itself is likely to be threatened. Mountain-top species were also identified as being very vulnerable and at risk as a result of climate change, with an increased number of threatened and vulnerable species. Mr Bildstein stressed the role of migration as an "engine" of biodiversity and vagrancy as evidence of the impacts of climate change. He called for protection of migration, especially in Southern Europe, and the need for further studies and research. Recommendations from this report included the setting up of a surveillance and monitoring network, as well as a new and more dynamic system of protected areas.

Some feedback provided in the discussion session included comments on the selection of raptors as indicators as other species of birds could be more representative of climate change impacts. It was proposed to also monitor breeding birds, including seabirds, wetland and coastal species. Members of the Group of Experts also suggested adding more sites to the list of key sites for monitoring, in particular in Eastern Europe, the Black Sea Coast, the Bosphorus and the Eastern part of Turkey. Members of the Group expressed concerns regarding the recommendation included in the report concerning "land custody" or land stewardship options and questioned whether this example from North America would be appropriate in Europe. There was also agreement that such a formula would in any case be in addition to the existing system and network of protected areas. Finally, it was agreed to include a strong reference to existing agreements such as the CMS, also active on this issue, and including a new report on the effects of climate change on migratory waterbirds to be published by AEWA.

11. Impacts of climate change on amphibian and reptile species

Mr Klaus Henle, Head of the Conservation Biology Department at the Helmholtz Centre for Environmental Research, based in Leipzig, presented the layout of his report, which is currently under preparation and will be distributed to members of the Group of Experts ahead of its next meeting. Mr Henle covered the following issues in is presentation: i) the sensitivity of amphibians and reptiles to climate factors; ii) some examples of modelling distributional changes; iii) and their conservation implications. He further explained that some reptile species could "benefit" from climate change but a careful assessment of this will be needed for certain species as they may experience expansion or regression linked to climate change. In addition, he warned that in some cases the modelling and biological knowledge are contradictory and that some priority research needs should be established, as many Western European species are likely to be strongly affected by climate change, including species in the Western Mediterranean.

12. Climate change and protected areas

Mr Jan Plesnik, Vice-Chair of the Bern Convention's Standing Committee and Chair of the Group of Experts on the Setting up of the Emerald Network of Areas of Special Conservation Interest, gave a presentation about protected areas and climate change. Mr Plesnik stated that there are two ways of responding to changes in biological diversity through protected areas: either to add new protected areas to existing ones (or to enlarge them); or to improve connectivity in the wider landscape. He further raised existing literature affirming that the creation of new protected areas can substantially improve the likelihood of species conservation as climate changes, and the need to expand protected areas towards the poles and/or towards higher altitudes. Mr Plesnik discussed the concepts of connectedness, landscape connectivity and ecological networks, including their physical elements and the existing debate on corridors. He concluded that for climate change adaptation measures, the development of stepping stones and the management of the wider landscape are more recommended than establishing linear corridors between protected areas. His main messages were that protected areas are a necessary, but not sufficient, conservation tool in the face of climatic change, and that protected areas should be complemented by appropriate adaptive management of the wider landscape.

13. RSPB report on "Climate change – wildlife and adaptation"

Mr Olly Watts, from the Climate Change Policy team of the Royal Society for the Protection of Birds (RSPB), presented their recent publication on climate change - wildlife and adaptation, which includes 20 questions and answers. The report covers how will climate change affect wildlife and the ways in which species are already responding to climate change, and referred to the "Climatic Atlas of European Breeding Birds". Mr Watts stressed that many uncertainties remain, including concerning future emissions and models, species responses to interacting impacts, and the speed of tracking climatic shifts. Mr Watts added that we can reduce uncertainty through research, monitoring, and improved knowledge. He further added that protected areas are an essential tool for biodiversity conservation and that their management, resilience and accommodation need to be adapted to climate change. The network of protected areas will also need to be expanded to accommodate species shifts, reduce fragmentation, and increase connectivity. Mr Watts concluded that a co-ordinated governmental adaptation response is needed across different policy areas such as agriculture, forestry, water, planning, and including cross sectoral integration of biodiversity concerns.

14. Views from Il Nibbio - Antonio Bana's Foundation for research on ornithological migration and environmental protection

Mr Ferdinando Ranzanici, from the European Foundation for research on ornithological migration and environmental protection, talked about their work on ornithological research, scientific activities on migratory birds, environmental education and dissemination. Mr Ranzanici stressed the need to recognise and reinforce the importance of research and monitoring at the national and international level, as well as of the governance of natural landscapes and habitats. He further mentioned the need to strengthen co-operation with groups and conventions already in place, as a basis on which to build work to develop tools and indicators related to biodiversity and climate change.

15. Next steps and plans for the next meeting

At the proposal of the secretariat, the Group of Experts agreed that:

- the draft reports presented would be finalised on the basis of the feedback and informations received;
- the Secretariat will liaise with the Groups of Experts under the Convention in order to identify and select priority species in relation to the impacts of climate change;
- a new report covering guidance and principles for adaptation strategies on the basis of a review of existing ones will be commissioned and presented at the next meeting;
- the Secretariat will prepare a draft recommendation on the basis of reports and discussions;

- it will identify areas of work for 2009, including the preparation of more detailed guidance for Parties on biodiversity and climate change, with a view to proposing to the Standing Committee that this Group becomes a "regular" Group of Experts under the Bern Convention.

The Secretariat informed that the next meeting of the Group of Experts will be held in Strasbourg in September 2008, with dates to be confirmed shortly.

16. Any other business

None were raised.

17. Closing

The Chair thanked participants for their active contribution over the two-day meeting, warmly thanked the organisers, the secretariat and the interpreters, and formally closed the meeting on Friday afternoon.

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Appendix 1

LIST OF PARTICIPANTS
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LISTE DES PARTICIPANTS

I. CONTRACTING PARTIES / PARTIES CONTRACTANTES

ALBANIA/ ALBANIE
Ms Elvana RAMAJ, Senior Expert, Nature Protection Policies Directorate, Ministry of the Environment, Forests & Water Administration, Rruga e Durrësit, No. 27, TIRANA.
Tel: +355 4 270 624/30 or +355 69 21 21425. Fax: +355 4 270 627/30. E-mail: eramaj@moe.gov.al or eramaj@hotmail.com

BULGARIA/ BULGARIE
Mr. Peter ZHELEV, PhD, Department of Dendrology, University of Forestry, 10, Kl. , Ochridsky Blvd. 1756 SOFIA
Tel: +359-2-91907 ext. 389 / +359-887-436530. Fax:: +359-2-8622830. E-mail: zhelev@ltu.bg or Peter_Zhelev@yahoo.com

CZECH REPUBLIC / REPUBLIQUE TCHEQUE
Mr Jan PLESNIK, Chair of the Group of Experts on the Emerald Network, Adviser, Agency for Nature Conservation and Landscape Protection of the Czech Republic, Nuselska 39, 140 00 PRAGUE 4
Tel: +420 241 082 114. Fax : +420 241 082 999. E-mail: jan.plesnik@nature.cz

Ms. Ing. Zuzana WICHEROVÁ, Department of Climate Change, Sink expert, UNFCCC, Ministry of the Environment of the Czech Rebublic, Vrsovicka 65, 100 10 PRAGUE 10
Tel.: +420 606 675 742. Fax: +420 267 126 278. E-mail: Zuzana_Wicherova@env.cz

DENMARK / DANEMARK
Mr Hans Skotte MØLLER, Senior Advisor, M.Sc. (Biology), Ministry of the Environment, Danish Agency for Spatial and Environmental Planning, Nature Division, Haraldsgade 53, DK 2100 Copenhagen Ø
Tel: + 45 7254 4700 (direct: + 45 7254 4858). Fax + 45 3927 9899. E-mail: hsm@blst.dk. Website: www.blst.dk

EUROPEAN COMMISSION / COMMISSION EUROPÉENNE
Ms Karin ZAUNBERGER, European Commission, Av. de Beaulieu 5, 1160 BRUSSELS, Belgium
Tel : +32 2 296 21 72. Fax: +32 2 299 08 95. E-mail : karin.zaunberger@ec.europa.eu

FRANCE / FRANCE
Ms Hélène SOUAN, Cellule Biodiversité, Direction de la nature et des paysages, Ministère de l'Ecologie, du Développement et de l'Aménagement durables, 20 avenue de Ségur 75007 PARIS
Tel : +33 1 42 19 20 94. Fax: +33 1 42 19 25 77. E-mail: helene.souan@developpement-durable.gouv.fr

GERMANY / ALLEMAGNE
Ms Cordula EPPLE, Scientific Officer, Federal Agency for Nature Conservation, Insel Vilm, 18581 PUTBUS
Tel: +49-38301-86136. Fax: +49-38301-86150. E-mail: cordula.epple@bfn-vilm.de

Mr Richard PODLOUCKY, Chair of the Group of Experts on the Conservation of Amphibians and Reptiles, Department of Nature Conservation, Lower Saxony State Agency on Water Management, Coastal Defence and Nature Conservation (NLWKN), Göttinger Chaussee 76 A, D-30453 HANNOVER
Tel.+49 511-3034-3202. Fax. +49 511-3034-3504.
E-mail: richard.podloucky@nlwkn-h.niedersachsen.de . Website : www.nlwkn.de

ICELAND / ISLANDE
Mr Snorri BALDURSSON, Head of Information Department, Icelandic Institute of Natural History , Hlemmur 3, 105 REYKJAVIK
Tel: +354 590 0500. Fax: +354 590 0595. E-mail snorri@ni.is

LATVIA / LETTONIE
Ms Inese GMIZO-LĀRMANE, Project coordinator, Nature Protection Department, Ministry of Environment, Peldu Street 25, RIGA
Tel. (+371) 7026484. Fax (+371) 7820442. E-mail: Inese.gmizo-larmane@vidm.gov.lv

NORWAY / NORVÈGE
Ms Else Marie LØBERSLI, Senior Adviser, Directorate for Nature Management, The Directorate for Nature Management, Tungasletta 2, N-7485 TRONDHEIM.
Tel: +47 580 635 / +47 580 500. E-mail: else.lobersli@dirnat.no

SPAIN / ESPAGNE
Dr María Ángeles RAMOS, Vice-Directrice de la Recherche MNCN, Coordinatrice du Projet Faune ibérique, Museo Nacional de Ciencias Naturales (CSIC), José Gutierrez Abascal 2, E-28006 MADRID.
Tel : +34 91 411 13 28 ext. 1116. Fax : +34 91 564 50 78. E-mail : m.ramos@mncn.csic.es
[*Apologised for absence / Excusé]*

Mr Ricardo GÓMEZ CALMAESTRA, Head of Section, Área de Planes y Estrategias de Conservación, Dirección General para la Biodiversidad, Ministerio de Medio Ambiente, C/ Ríos Rosas, 24, 28003 MADRID
Tel: +34 917493866. Fax: +34 917493873. E-mail: RGCalmaestra@mma.es

Mr Alfonso GUTIERREZ TEIRA, Área de Estrategias de Adaptación, Oficina Española de Cambio Climático, Ministerio de Medio Ambiente, C/ Alcalá, 92, 28071 MADRID
Tel.+34 914361497. E-mail: AGutierrez@mma.es

Mr Carlos VILLALBA ALONSO, Consultant on Biology and Nature Conservation, c/ Ezcurdia, 192 7P. 33203 GIJÓN.
Tel: +34 699 612 518. E-mail: villalba@terrae.net

Regional Authorities / Autorités régionales – Andalusian Government – Junta Andalucia

Mr José GUIRADO, Dirección General de Gestión del Medio Natural
Mr Felipe OLIVEROS, Dirección General de Gestión del Medio Natural
Mr Jose María OLIET, Dirección General de Gestión del Medio Natural
Mr Fernando ORTEGA, Dirección General de Gestión del Medio Natural
Ms Francisca de la HOZ, Dirección General de Gestión del Medio Natural

Ms Rosario PINTOS MARTÍN, D.G. Red Espacios Naturales Protegidos y Servicios Ambientales,

Mr Javier SÁNCHEZ GUTIÉRREZ, Director Parque Nacional, Parque Natural Sierra Nevada, Carretera de la Sierra, km 7, E-18191 PINOS GENIL (GRANADA).
Tel: +34 958 026 303. Fax: +34 958 026 310. E-mail: ph.snevada.cma@juntadeandalucia.es

Mr Francisco QUIRÓS HERRUZO, Espacio Natural Doñana,

Mr Jesús CABELLO MEDINA, Parque Natural Estrecho,

Mr F. Javier COBOS AGUIRRE, D.G. Red Espacios Naturales Protegidos y Servicios Ambientales,

Mr Miguel MÉNDEZ, D.G. Prevención y Calidad Ambiental,

Mr Carlos Juan CEACERO, Climate Change Unit Worker, EGMASA, c/ Joan G. Gutenbert, 1, Isla Cartuja, SEVILLA.
Tel: +34 670 941 623. E-mail: cceacero@egmasa.es

SWEDEN / SUÈDE
Ms Karin SKANTZE, Swedish Environmental Protection Agency, Vallhallavälten 195, SE-106 48 STOCKHOLM.
Tel : +46 8 698 15 01. Fax: +46 8 698 10 00. E-mail : Karin.Skantze@naturvardsverket.se

TUNISIA / TUNISIE
Mr Mohamed ZMERLI, Ingénieur Principal, Cherf de service Evolution environnementale, Ministère de l'Environnement et du Développement durable, Immeuble ICF Centre urbain nord, Boulevard de la Terre, Cedex 1080 TUNIS
Tel : +216 70 728644. Fax. +216 70 728 655. E-mail: zmerli2004@yahoo.fr

TURKEY / TURQUIE
Ms Serap YILMAZ, Ministry of Environment and Forestry, Söğütözü Caddesi no:14/e Beştepe / ANKARA
Tel: +90 (312) 207 50 00. Fax: +90 (312) 207 59 81. E-mail: skayaturk@yahoo.com

Ms Sibel ŞENEL, Ministry of Environment and Forestry, Söğütözü Caddesi no:14/e Beştepe / ANKARA
Tel: +90 (312) 207 50 00. Fax: +90 (312) 207 59 81. E-mail: senelsibel@yahoo.com

UNITED KINGDOM / ROYAUME-UNI
Ms Caroline COWAN, Strategic Advisor Climate Change, Natural England, 3B8 Ashdown House, 123 Victoria Street, LONDON, SW1E 6DE
Tel: +44 (0)7826 868974. E-mail: caroline.cowan@naturalengland.org.uk

Ms Deborah PROCTER, Climate Change Adviser, JNCC, Monkstone House, City Road, PETERBOROUGH, PE1 1QQ
Tel: +44 (0)1733 866809. Fax: +44 (0)1733 56262. E-mail: Deborah.Procter@jncc.gov.uk. Website: www.jncc.gov.uk

II. OBSERVERS / OBSERVATEURS

BirdLife International - Royal Society for Protection of Birds (RSPB) / BirdLife International - Société royale pour la protection des Oiseaux (RSPB)
Mr Olly WATTS , Senior Climate Change Policy Officer, RSPB Sustainable Development Department , The Lodge, Sandy, Bedfordshire SG19 2DL, United Kingdom
Tel: +44 1767 69 3084. E-mail : olly.watts@rspb.org.uk

Coastwatch Europe
Ms Karin DUBSKY, with Civil and Env. Eng., TCD, DUBLIN 2, Ireland.
Tel : +353 86 8111 684. Fax: +353 53 94 25046. E-mail : kdubsky@coastwatch.org

Convention on Biological Diversity (CBD) / Convention sur la diversité biologique (CDB)
Ms. Jaime WEBBE, Climate Change Programme Officer, CBD Secretariat, 413, Saint Jacques Street, suite 800, MONTREAL QC H2Y 1N9, Canada
Tel +1 514 287 8718. E-mail: jaime.webbe@cbd.int *[Apologised for absence / Excusé]*

Global Biodiversity Information Facility (GBIF)
Mr Francisco PANDO, Ph.D., Responsable, GBIF.ES, Unidad de Coordinación, Real Jardín Botánico – CSIC, Plaza de Murillo, 2, 28014 MADRID, Spain.
Tel.+34 91 420 3017 x 274. Fax +34 91 429 2405. E-mail: pando@gbif.es. Website: www.gbif.es

Il Nibbio – Antonio Bana's Foundation for research on ornithological migration and environmental protection / Il Nibbio – Fondation Antonio Bana pour la recherche des migrations ornithologiques et la protection de l'environnement
Mr Ferdinando RANZANICI, Fondazione Europea Il Nibbio (FEIN), Via Antonio, 11, 20122 MILAN, Italy
Tel: / Fax: +39 031762162 e-mail: ferdinando.ranzanici@tin.it , http://www.nibbio.org

Ms Viviana GALLIZIOLI, Fondazione Europea Il Nibbio (FEIN), Via Perego, 22060 AROSIO, Italy
Tel: / Fax: +39 031762162 E-mail: fein@nibbio.org , http://www.nibbio.org

United Nations Environment Programme – Mediterranean Action Plan
Regional Activity Centre for Specially Protected Areas (RAC/SPA) – Tunis / Centre d'activités régionales pour les aires spécialement protégées (CAR/ASP)
Mr Atef OUERGHI, Expert on Marine Biology, Regional Activity Centre for Specially Protected Areas, (RAC/SPA), Boulevard du leader Yasser Arafat, BP 337, 1080 TUNIS Cedex, Tunisia
Tel : + 216 71 206649/206 485/206 851. Fax: +216 71 206490. E-mail: atef.ouerghi@rac-spa.org

Migres Foundation
Mr Keith L. BILDSTEIN, Scientific Director, Hawk Mountain Sanctuary, 410 Summer Valley Road, Orwigsburg, PA 17961, USA
Tel: +1 1 570 943 3411 ext. 108 (office); + 1 610 781 7358 (cell). Fax: +1 570 943 2284
E-mail: bildstein@hawkmtn.org

Mr Luis BARRIOS, Technical Director, Migres Foundation

Asesores Técnicos de Medio Ambiente SL (ATECMA)
Mr Ernesto RUIZ RICHI, c/ Isla de la Toja nº 2 Escalera Izda 3º A, Collado Villalba E-28400 MADRID, Spain.
Tel: +34 91 849 08 04. Fax: +34 91 849 14 68. E-mail: ernesto.ruiz@atecma.es

III. CONSULTANTS / EXPERTS CONSULTANTS

Ms Pamela BERRY, Senior Research Fellow, Environmental Change Institute, Oxford University Centre for the Environment, Dyson Perrins Building, South Parks Road, OXFORD OX1 3QY / United Kingdom.
Tel: +44 (0)1865 275882. Fax: +44 (0)1865 275850. E-mail: pam.berry@eci.ox.ac.uk

Ms Laura CAPDEVILA-ARGUELLES, Co-ordination Unit, GEIB Grupo Especialista en Invasiones Biológicas, Unidad de coordinación, C/ Tarifa 7 Navatejera 24193 LEÓN / Spain
Tel: +34 626 169 568. E-mail: laura.capdevila@gmail.com or geib.uc@gmail.com . Web: http://geib.blogspot.com

Mr Miguel FERRER, Estación Biológica de Doñana, Av. M. Luisa S/N, Apdo. 1056, E-41080 SEVILLA, Spain
Mobile tel: 00 34 609 587 869. E-mail: mferrer@ebd.csic.es

Mr Klaus HENLE, Head of Department of Conservation Biology, Helmholtz Centre for Environmental Research – UFZ, Permoserstraße 15, 04318 LEIPZIG/ Germany
Tel. +49 341 235-1270. Fax. +49 341 235-1470. E-mail: Klaus.Henle@ufz.de

IV. COUNCIL OF EUROPE / CONSEIL DE L'EUROPE

Congress of Local and Regional Authorities of the Council of Europe / Congrès des pouvoirs locaux et régionaux du Conseil de l'Europe

Mr Willy BORSUS, Member of the Committee on Sustainable Development, Congress of Local and Regional Authorities of the Council of Europe, Deputy Mayor of Somme-Leuze (Belgium), Rue du Cantre 1, 5377-SOMME-LEUZE, Belgique
Tel. +32 86 32 21 22. Fax +32 86 32 33 38. E-mail: willy.borsus@publilink.be

Parliamentary Assembly of the Council of Europe / Assemblée parlementaire du Conseil de l'Europe

Ms Manuela de MELO, Vice-Chair of the Sub-Committee on Sustainable Development, Committee on the Environment, Agriculture and Local and Regional Affairs, R. Bolama, 113 5°E, 4200-139 PORTO, Portugal.
Tel: +351 21 391 9396. Fax: +351 21 391 7463. E-mail: manuelamelo@ps.parlamento.pt

V. INTERPRETERS / INTERPRETES

Ms Ingrid CATTON-CONTY, 26, rue de l'Yvette, F-75016 PARIS, France.
Tel: +33 1 40 50 04 22. Fax: +33 1 40 50 80 84. E-mail: ingrid.catton@wanadoo.fr

Ms Starr PIROT, Chemin des Toches CH-1261 LONGIROD, Suisse.
Tel : +41 22 368 20 67. Fax: +41 (22) 368 20 73. E-mail: s.pirot@aiic.net

Mr William VALK, 2, rue des Jardins, Duntzenheim, F-67270 HOCHFELDEN, France.
Tel: +33 3 88 70 59 02. Fax: +33 3 88 70 50 98. E-mail: william.valk@wanadoo.fr

VI. SECRETARIAT / SECRETARIAT

Migres Foundation

Mr Andrés SÁNCHEZ, Fundación Migres
Tel: +34 687900514. E-mail: asanchez@fundaciónmigres.org

Council of Europe / Conseil de l'Europe, Directorate of Culture and of Cultural and Natural Heritage / Direction de la Culture et du Patrimoine culturel et naturel, F-67075 STRASBOURG CEDEX, France Tel : +33 388 41 20 00. Fax : +33 388 41 37 51

Ms Carolina LASÉN DÍAZ, Administrator of the Biological Diversity Unit / Administrateur de l'Unité de la Diversité biologique
Tel : +33 390 21 56 79. Fax : +33 388 41 37 51. E-mail : carolina.lasen-diaz@coe.int

Ms Véronique de CUSSAC, Biological Diversity Unit / Unité de la Diversité biologique
Tel : +33 388 41 34 76. Fax : +33 388 41 37 51. E-mail : veronique.decussac@coe.int

Appendix 2

Group of Experts
on Biodiversity and Climate Change

Seville, Spain (13-14 March 2008)

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AGENDA

Thursday 13th March

09:30 – 10:30 Welcome and opening

1. **Opening of the meeting by the Chair**
2. **Address by Mrs Fuensanta Coves, *Consejera de Medio Ambiente de la Junta de Andalucía***
3. **Adoption of the agenda**
4. **Introduction by the Secretariat** (Ms Carolina Lasén Díaz)

10:30 – 12:00 Biodiversity and climate change in other fora

5. **Updates on biodiversity/climate change work in other fora:**
   a. Barcelona Convention (Mr Atef Ouerghi, Regional Activity Centre for Specially Protected Areas - RAC/SPA)
   b. European Union (Ms Karin Zaunberger, European Commission, DG Environment)
   c. European Environment Agency (Mr Snorri Baldursson, Chair of the SEBI 2010 Expert Group on "Indicators of impact of climate change on biodiversity")
   d. Global Biodiversity Information Facility (Mr Francisco PANDO, Coordinator of the Spanish node)

12:00 – 13:30 National reports

6. **Brief national reports on activities and initiatives on biodiversity and climate change**

14:30 – 17:30 Draft reports for discussion

7. **Review of available information on direct and indirect impacts of climate change on biodiversity and identification of most vulnerable species and habitats** (Ms Pam Berry, Environmental Change Institute, Oxford University Centre for the Environment)
8. **Climate change and invasive alien species** (Ms Laura Capdevila–Argüelles, GEIB Specialist Group in Biological Invasions)

Friday 14th March

09:30 – 10:00 Climate change at the Council of Europe

9. **Brief presentations of climate change work at the Council of Europe**
   a. Representative of the Parliamentary Assembly of the Council of Europe (Mrs Manuela Melo, Vice-Chair of the Sub-Committee on Sustainable Development)
   b. Representative of the Congress of Local and Regional Authorities (Mr Willy Borsus, Member of the Committee on Sustainable Development, rapporteur on "Biodiversity policies for urban areas")

10:00 – 12:00 Draft reports for discussion (cont.)

10. **Climatic change and the conservation of migratory birds in Europe: identifing effects and conservation priorities** (Mr Keith Bildstein, Scientific Director, Hawk Mountain Sanctuary, Pennsylvania)
11. **Impacts of climate change on amphibian and reptile species** (Mr Klaus Henle, Helmholtz Centre for Environmental Research – UFZ)

12:00 – 13:30 Other items for discussion

12. **Climate change and protected areas** (Mr Jan Plesnik, Chair of the Group of Experts on the Emerald Network)
13. **RSPB report on "Climate change - wildlife and adaptation"** (Mr Olly Watts, RSPB Climate Change Policy Team)
14. **Views from Il Nibbio, Antonio Bana's Foundation for research on ornithological migration and environmental protection** (Mr Ferdinando RANZANICI, Il Nibbio)

14:30 – 17:00 Follow-up work to prepare draft recommendations

15. **Other issues included in the work plan of the Group of Experts**
16. **Next steps and plans for the next meeting**
    a. Liaising with and input from other Groups of Experts under the Bern Convention
    b. Finalising reports
    c. Preparation of draft guidance and recommendations
17. **Any other business**
18. **Closing**

Saturday 15th March

Excursion to Doñana National Park

Departure and return to Hotel Occidental (back at the hotel at 5pm at the latest)

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Appendix 3

REPORTS OF NATIONAL ACTIVITIES ON BIODIVERSITY AND CLIMATE CHANGE

1. ALBANIA / ALBANIE

ALBANIA NATIONAL REPORT

Background

Albania is a Party to UNFCCC from January 1995, having the status of anon-Annex I Party. Albania also joined the Kyoto protocol on 16th December 2004.

As a coastal country with a fragile environment lying in the Mediterranean, Albania is vulnerable to global climate change. The future scenarios for Albania predict changes such as increased temperatures, decreased precipitation, reduction of water resources and loss of arable land.

In Albania, per capita emissions of GHG are relatively low due to the fact that 94 % of electric power is generated by hydro sources. However, emissions per GDP are relatively high. The main source of GHG emissions is the energy sector, which accounts for 44 % and forests (fuel wood) which contribute 21 % of the total. Based on the predictions for future emissions, it is expected that by 2020 total GHG emissions will rise from 7061.5 Gg in 1994 to a level of 37.653 Gg.

A national Climate Change Programme Unit is established from 1998 at the Ministry of Environment. A steering committee is also up and running.

Projects

- **Albania's First National Communication**

The project enabled Albania to prepare its First National Communication with the Conference of the Parties of the UN Framework Convention on Climate Change.

- **Technology Needs Assessment - Top up Phase**

Additional funds are requested from the Government of Albania under the Operational Guidelines for Expedited Financing of Climate Change Enabling Activities (EA) - Phase II.

- **Capacity Building for Improving the Quality of GHG Inventories (Europe/CIS region)**

The project has initiated a regional programmatic approach to build capacity for improving the quality of national GHG inventories, using the good practices guidance of the IPCC for cost - effectiveness.

- **Stocktaking exercise**

The main objective of the self-assessment exercise was to undertake a highly consultative and participatory process of needs assessment to identify and validate the critical priorities for UNFCCC implementation in Albania in general, and was considered as the first but *critical step* in preparing the Second National Communication project proposal.

- Albania's second national communication

This project *aims* at enabling Albania to prepare and report its Second National Communication with the Conference of the Parties (CoP) of the UN Framework Convention on Climate Change.

- **Article 6 Project (Education, training & public awareness)**

The project on Article 6 of UNFCCC (education, training and public awareness) funded by UNEP aims to enhance the level of public awareness on climate change in Albania in order to enable the country to comply with UNFCCC and Kyoto Protocol provisions and to mainstream climate change issues into national policies and strategies.

- **PDF B: Albania - Market Transformation for Solar Thermal Water Heating**

The project is seeking to accelerate the market development for solar water heating in Albania with the objective to achieve the level of 50,000 m^2 of installed solar water heating capacity by the

end of the project and facilitate the sustainable growth of the market at the average annual rate of 20% after the project has ended.

- **PDF A: Identification and implementation of adaptation response measures in Drini - Mati River Deltas**

Gef through the UNDp together with cost sharing from the Government of Albania have funded the project preparatory phase PDF A: "Identification and implementation of adaptation response measures in Drini _ Mati Deltas" which aims to to build adaptive capacities in the Dini - Mati River Delta areas in order to protect vulnerable ecosystems and local livelihoods.

- **Building Capacity to Access Carbon Finance in Albania**

The project will help the Government of Albania to develop its public and private sector capacities to access carbon finance in Albania by (i) creating a legal and institutional framework for carbon finance and (ii) building in-country capacities for identification, implementation of and resource mobilization for the greenhouse gas reduction projects eligible for Clean Development Mechanism and other carbon market mechanisms.

- **Crosscutting project**

The objective of the National Capacity Self Assessment is to assess capacity needs and priorities with respect to the global environment and within the context of sustainable development so that Albania can meet the requirements of the Global Environmental Conventions in a coordinated and strategic manner.

- Lately on 29 February 2008 a Training Workshop "Building Capacities for dealing with Carbon Financing in Albania" One-day training workshop on institutional and legal aspects of the carbon financing in Albania was organized by Climate Change Program

Policy development

- Review and updating of the National Biodiversity Strategy and Action Plan by 2010.
- Reducing emissions from deforestation – as agreed by parties at the 13th Conference of Parties (COP-13) in December 2007 to strengthen efforts to reduce emissions from deforestation and forest degradation
- Development of successful mechanisms to reduce greenhouse gas emissions from deforestation in a developing country like Albania, will increase the resources available to support forest conservation and sustainable use and also support people dependent on forest ecosystems. Efforts are being made each year by supporting the forestry services in order to better combat the illegal logging as Albania has still a negative figure between the forest cuts and reforestation.
- Windpower as a key renewable resource for electricity generation. This year for the first time in Albania two wind power projects have been approved and are taking place.
- Hydropower as a renewable energy resource developed at small and large scales. Albania still rely heavily on hydropower. In such regards projects for construction of hydropower plants are ongoing.

2. ARMENIA / ARMENIE

As it was reported in the First National Communication on climate change, the global climate change will have a significant impact on conditions for the existence of the majority of natural ecosystems of Armenia. More specifically, those conditions will shift up the mountain for 150-200 m. The report also indicated most vulnerable ecosystems threatened by transformation. Since the First National Communication, no other additional data have been generated. Instead, new scenarios for climate change will be developed, and on the basis of those scenarios new conclusions will be made concerning the vulnerability of natural ecosystems in various regions of the country. My understanding is that those conclusions are not likely to undergo significant changes.

Taking into consideration the above statement, the following is suggested for the purpose of the research to be made under the Second National Communication: single out those areas and ecosystems of Armenia, which are not included in specially protected areas, but have in their structure biodiversity species of global and/or national importance, and suggest adaptation measures aimed at those species in the form of management plans for those territories. These will be "Important plant areas" or areas important to the biodiversity as a whole included in the "Emerald" network.

The above areas will be inclusive of most important and vulnerable ecosystems such as salted swamps on the Ararat valley (the rarest plant species included in the Red Book of Armenia: Linum barsegianii, Thesium compressum, Iris musulmanica, Reseda globulosa, Microcnemum coralloides, etc.) threatened to become extinct (disappear) in the result of dry-out and overly salinization; subalpine meadows and meanders on the upper-river Argichi of the Sevan basin containing a number of rare species and threatened by aridization; some areas of steppes, subalpine meadows and tall grasses on other mid-high mountain ridges of Armenia, particularly the Shirak mountain ridge (where shift of conditions from steppes to semi-deserts is possible), as well as Bazum, Pambak, Bargushat, Meghri and Javakhet mountain ridges. The list will obviously include several small relic lakes (e.g. Chmoi-lich, Chili-lich and others) and will quite possibly include Arteni mountain, with a very rich and specific flora and fauna, whose ecosystem is endangered by aridization and intensive spread of semi-desert conditions.

It is worthwhile to note that some of those areas may be included both in "Important plant areas" and "Emerald" network, others – in "Important plant areas" only.

It should be noted that the above suggestions is the result of a very preliminary knowledge of the spread of rare species and ecosystems in Armenia. A detailed research and analysis is needed for the current conditions and spread of species and ecosystems in the country, supplemented with a forecasting research on the basis of the suggested scenarios of climate change.

Invasive and expansive species of plants that are a potential threat for natural ecosystems of Armenia

Species	Introduction	Status	Threat
Acer ibericum	Aborigine	Expansive species	Intensively spreading in arid and semi-arid communities
Acer negundo	Introduced	Potentially invasive species	Independently spreading in towns and settlements, more rarely in the disturbed habitats
Acroptilon repens	Aborigine	Expansive species	Plentiful on disturbed habitats, abandoned fields
Ailanthus altissima	Introduced	Invasive species	Intensively penetrates natural ecosystems
Alliaria petiolata	Aborigine	Potentially expansive species	Widespread in Armenian forests, but not plentiful and do not of an immediate threat
Amaranthus retroflexus	Aborigine	Invasive species	Widespread in Central Armenia, especially on disturbed areas and in the towns
Ambrosia artemisiifolia	Accidentally introduced	Potentially invasive species	Revealed at first in the north of Armenia in1983 (Gabrielian & Tamanyan 1985, Avetisyan 1995), currently is spreading in Erevan city and Ararat valley
Anemone fasciculata	Aborigine	Expansive species	Intensively spreading in sub-alpine meadows

Anthemis cotula Anthemis triumfettii	Aborigine	Expansive species	Intensively spreading in meadows, abandoned fields and edges of forests
Arctium palladinii	Aborigine	Expansive species	Intensively spreading on disturbed habitats, especially on forest glades
Artemisia vulgaris	Aborigine	Expansive species	Intensively spreading on disturbed habitats
Astragalus galegiformis	Aborigine	Expansive species	Intensively spreading on forest edges, roadsides in North Armenia
Caltha palustris	Aborigine	Expansive species	Intensively spreading on wetlands in middle and upper mountain belts
Cardaria boissieri, Cardaria draba	Aborigine	Potentially invasive species	Intensively spreading on disturbed habitats, abandoned fields
Carduus hamulosus, Carduus nutans	Aborigine	Expansive species	Intensively spreading on disturbed habitats
Centaurea behen	Aborigine	Expansive species	Intensively spreading in steppe communities
Centaurea diffusa	Aborigine	Potentially invasive species	Weed in the cereals fields, penetrating into natural ecosystems (steppes)
Centaurea iberica	Aborigine	Expansive species	Intensively spreading in disturbed habitats in arid and semi-arid zones
Centaurea solstitialis	Aborigine	Potentially invasive species	Widespread in disturbed habitats
Chamaesyce maculata	Aborigine	Expansive species	Widespread in disturbed habitats in semi-desert
Chenopodium botrys	Aborigine	Expansive species	Widespread in disturbed habitats
Chondrilla juncea	Aborigine	Potentially invasive species	Widespread in disturbed habitats
Circaea lutetiana	Aborigine	Expansive and potentially invasive species	Intensively spreading in disturbed forest habitats
Cirsium anatolicum, Cirsium arvense, Cirsium congestum, Cirsium incanum, Cirsium vulgare	Aborigine	Expansive and potentially invasive species	Intensively spreading in disturbed habitats, especially on abandoned fields
Clematis orientalis	Aborigine	Expansive species	Intensively spreading along rivers of Ararat valley
Conium maculatum	Aborigine	Expansive species	Intensively spreading in disturbed habitats, the spread in sub-alpine communities is registered
Consolida orientalis	Aborigine	Expansive species	Intensively spreading in steppes, semi-deserts, very plentiful in abandoned fields
Conyza canadensis	Aborigine	Invasive species	Intensively spreading in forests, especially in disturbed areas
Crupina vulgaris	Aborigine	Expansive species	Intensively spreading in steppes
Descurainia sophia	Aborigine	Expansive species	Growing mainly in ruderal habitats, penetrating forest and meadows
Erigeron acer, Erigeron annuus	Aborigine	Expansive species	Intensively penetrating steppes and meadows
Erodium cicutarium	Aborigine	Expansive species	Intensively spreading in disturbed habitats in arid and semi-arid zones
Euclidium syriacum Eichhornia crassipes and *Eichhornia azurea*	Aborigine	Expansive species	Intensively spreading in disturbed habitats in arid and semi-arid zones
Euphorbia seguieriana	Aborigine	Expansive species	Intensively spreading in steppe pastures by first signs of overgrazing
Galinsoga ciliata, Galinsoga parviflora	Accidentally introduced	Potentially invasive species	Widespread in towns, settlements; not registered yet in natural ecosystems
Geranium tuberosum	Aborigine	Expansive species	Intensively spreading in abandoned fields
Glechoma hederacea	Aborigine	Expansive species	Intensively spreading in disturbed forest habitats
Gleditschia triacanthos	Introduced	Potentially invasive species	Spreading along irrigation channels in Ararat valley
Helianthus tuberosus	Introduced	Potentially invasive species	Are cultivated on small squares, rarely met on ruderal and disturbed habitats
Heracleum antasiaticum, Heracleum schelkovnikovii, Heracleum trachyloma	Aborigine	Expansive species	Spreading in disturbed habitats in humid and semi-humid zones
Impatiens glandulifera	Accidentally (?)	Potentially invasive	Found in North Armenia, needs special control

	introduced	species	
Iva xanthifolia	Accidentally introduced	Potentially invasive species	Found in West Armenia, needs special control
Leontodon hispidus	Aborigine	Expansive species	Spreading in steppes and meadows
Lepidium latifolium, *Lepidium ruderale*	Aborigine	Expansive species	Spreading in disturbed habitats
Leucanthemum vulgare	Aborigine	Expansive species	Intensively spreading in abandoned fields, penetrates meadow and steppe communities
Lythrum salicaria	Aborigine	Potentially invasive species	Widespread on wetlands
Onopordum acanthium	Aborigine	Potentially invasive species	Spreading in disturbed habitats
Papaver macrostomum	Aborigine	Expansive species	Intensively spreading in steppe and meadow communities
Peganum harmala	Aborigine	Expansive species	Spreading in disturbed habitats
Picris hieracioides	Aborigine	Expansive species	Spreading in disturbed habitats
Polygonum alpinum	Aborigine	Expansive species	Intensively spreading in sub-alpine communities
Populus alba	Aborigine	Expansive species	Spreading on wetlands
Rhynchocorys orientalis	Aborigine	Expansive species	Intensively spreading in meadows
Robinia pseudoacacia	Introduced	Potentially invasive species	Rarely met in natural communities, do not of a threat yet
Salix caprea	Aborigine	Expansive species	Intensively spread in disturbed forest habitats
Sanicula europaea	Aborigine	Expansive and potentially invasive species	Intensively spread in disturbed forest habitats
Scandix stellata	Aborigine	Expansive species	Intensively spread in abandoned fields, penetrates meadow and steppe communities
Siegesbeckia orientalis	Aborigine	Expansive species	Spreading in steppes and semi-deserts
Silybum marianum	Aborigine	Expansive species	Enlarged a lot its area in South and North Armenia within last years.
Solidago virgaurea	Aborigine	Potentially invasive species	Widespread in forest and meadow communities
Sonchus oleraceus	Aborigine	Expansive species	Spreading in wetlands
Sphaerophysa salsula	Accidentally introduced	Invasive species	Revealed first in Armenia in 1990 (Zakharian & Fayvush 1991); within those years is spread in Ararat valley
Spinacia tetrandra	Aborigine	Expansive species	Spreading in semi-deserts
Tagetes minima	Introduced	Invasive species	Was introduced as ornamental plant, now spread in disturbed ecosystems
Tanacetum parthenium	Aborigine	Expansive species	Spreading in steppes
Tanacetum vulgare	Aborigine	Potentially invasive species	Is distributed on disturbed areas in Central Armenia
Tribulus terrestris	Aborigine	Expansive species	Intensively spreading in disturbed habitats in arid and semi-arid zones
Tripleurospermum caucasicum, *Tripleurospermum transcaucasicum*	Aborigine	Expansive species	Intensively spreading in meadow and steppe communities, especially during overgrazing
Veratrum album	Aborigine	Expansive species	Intensively spreading in meadow associations during overgrazing
Verbascum georgicum, *Verbascum laxum*	Aborigine	Expansive species	Intensively spreading in abandoned fields and disturbed habitats
Xanthium italicum, *Xanthium spinosum*, *Xanthium strumarium*	Aborigine	Potentially invasive species	Widespread in disturbed habitats
Xeranthemum squarrosum	Aborigine	Expansive species	Intensively spread in steppes and semi-deserts, especially in disturbed habitats

3. BULGARIA / BULGARIE

NATIONAL REPORT – BULGARIA

BIODIVERSITY AND CLIMATE CHANGE

A. Government level

The United Nations Framework Convention on Climate Change (UNFCCC) was ratified by the Parliament of Bulgaria in 1995.

Consecutively, the First National Action Plan for Climate Change was developed during the period 1996-1997 and adopted in 2000. The actions set in the Plan were implemented in the period 2000-2004. A 56 % decrease of greenhouses emission was reported in comparison with 1998.

The Kyoto Protocol was ratified in 2002.

The Second National Action Plan concerns the period 2005-2008.

Measures taken

- Since 01.01.2007 Bulgaria started implementing of Directive 2003/87/EC and introduced quotes for trade of greenhouse gases emissions.
- National Inventories on greenhouse gases emissions
- Reporting
- Joins implementations with The Netherlands, Denmark, Austria, Japan, France and Filnland;
- Afforestation;
- Special measures for forest fire control in order to prevent losses of forest biodiversity.
- Monitoring on the biodiversity in selected sites.

The measures planned in the Progress Report issued by the Ministry of Environment and Waters include focusing on biodiversity conservation in the zones above 800 m in altitude, which are expected to be less affected by the climate change.

B. Research

A monograph was published "Drought in Bulgaria. A contemporary analogue of climate change" (Knight G., and Raev I., eds.).

Extensive climate studies were performed in the forests during the last 30 years. The studies are part of long-term monitoring process and include a periodic survey on the plant diversity.

The University of Forestry develop dendrochronological studies in order to reconstruct the climate regime in representative parts of the country. The studies are aimed to predict the status of the forests in relation to climate change. These predictions could serve as a base for decision making for future sustainable management.

The project "Evaluation of Sweet chestnut stands dynamics in the condition of global climate change" was completed in the Central Laboratory of General Ecology.

C. NGOs

British Chevening Scholarships Programme organized a seminar "Climate changes and NATURA 2000". (28 June 2007) with participation of more than 80 representatives of the municipal and state administration, NGOs and experts.

Bulgarian Biodiversity Foundation (BBF) organizes seminars with students on the problems of biodiversity conservation.

Bulgarian Society for the Protection of Birds (BSPB) BSPB has contributed to a number of international projects in cooperation with partners from more than 20 other countries. Some of the projects concern the effect of the climate change on bird migrations.

4. CZECH REPUBLIC / REPUBLIQUE TCHEQUE

BIODIVERSITY AND CLIMATE CHANGE – NATIONAL REPORT OF THE CZECH REPUBLIC

Ms. Zuzana Wicherova, LULUCF Expert, Ministry of the Environment, wicherova@env.cz

Within the National Biodiversity Strategy of the Czech Republic approved by the Government in May 2005 (www.chm.nature.cz), a special chapter deals with biological diversity and climate change. Its main aim shall be to elaborate synergies between biodiversity and climate policies when preparing and implementing various measures.

In 2004 the Ministry of the Environment of the Czech Republic released National Program to Abate the Climate Change Impacts in the Czech Republic (http://www.env.cz/AIS/web-en.nsf/pages/Climate_Change). The program includes main policies and measures for reducing greenhouse gas emissions as well as adaptation strategy. It has been evaluated in 2007 with a special view to the assessment of the effects brought by measures implemented since 2004. The evaluation should be approved by the Government soon.

The Climate Change team (the Ministry of Environment of the Czech Republic) has been working on a new Climate Protection Policy in the Czech Republic that includes both mitigation and adaptation strategy. When preparing the document we will go out from the results of the evaluation of the recent National program and we will also list a proposal of new measures that should be implemented. The impacts on biodiversity and the measures to protect it will be taken into account. The Climate Change Protection Policy should be finished till September 2008.

For example afforestation of unexploited agricultural land belongs among the mitigation measures, for adaptation measures that can positively influence biodiversity we can list: soil protection (against erosion and other land degradation), natural habitat and native species protection, supporting natural processes in ecosystems, measures against the expansion of invasive alien species or water courses restoration.

Measures to abate climate change and its impacts are also reflected in other documents dealing with the landscape management, such as National Forest Programme II (under preparation). In Key Action 6 we can see for example the need for support of semi-natural forest management with high species diversity or change in forest classification and typology. For agriculture we can highlight Agri-environmental Programmes/Schemes, land replotting and consolidation and national and sub-national ecological networks, called the Territorial Systems of Ecological Stability of the Landscape aiming at creation of the multifunctional landscape.

The significant problem in developing and implementing adaptation strategies causes weak regional prediction of climate change impacts. It is difficult to work on any strategy without progress in this area and so we have to wait for particular results of ongoing research.

In terms of research, there are two projects on adaptation to climate change in the Czech Republic going on at the moment. The aim of one of them is to downscale global models to regional conditions of the Czech Republic and to elaborate concrete measures in water management, agriculture and forestry sectors. The second project addresses adaptation measures in small forest drainage areas/river basins with a special view to water management in those ecosystems. Results from these projects are expected in a 5-year term.

In addition, some projects on possible climate change impacts on the model components of biological diversity at all three main levels have been carried out mainly by universities and institutes of the Academy of Sciences of the Czech Republic, funded by the Council of the Government of the Czech Republic for Research and Technological Development through the Ministry of the Environment of the Czech Republic (e.g., modelling the possible distribution of plant invasive alien species throughout the country, shifting the tree line, etc.)

5. DENMARK / DANEMARK

CURRENT AND PLANNED INITIATIVES ON CLIMATE CHANGE AND BIODIVERSITY

Major relevant initiatives include:

- **An overall national strategy for adaptation to climate changes** ("Strategi for tilpasning til klimaændringer i Danmark") was launched by the Government in March 2008. The strategy describes a number of initiatives to be implemented by the various sectors during the next decade.

  Concerning nature and nature conservation the following climate effects are expected in Denmark: 1) Increased biological production caused by increased temperatures and prolongation of the growth season; 2) increased eutrophication causing increasing overgrowth and increased oxygen depletion in the interior waters; 3) increased erosion and flooding of shallow coastal areas, salt-marshes and river-valleys due to increased water-levels in the sea, increased precipitation and changes in the temporal pattern of the precipitation.

  Among the climate adaptation tools relevant in nature management the strategy emphasizes:

  1) restoration of certain river-valleys to the state of natural, extensively managed wetlands; 2) targeting the use nature protection orders, detailed planning related to the NATURA 2000 and Water framework directives, nature restoration and grant schemes in order to increase ecological connectivity in the fragmented Danish landscapes; 3) an action plan on invasive species will include analyzes of the need of efforts related to the climate changes in order to prevent negative consequences of existing or possible new invasive species.

  Economic analyzes will be needed to assess the gains and losses of the various initiatives including the use of nature's own climate adaptation measures supported by physical planning and regulations.

  Eventually, the strategy will e.g. support widespread dissemination of information through a 'climate adaptation portal' (to be established at the new Ministry of Climate and Energy) and a strategy on research on adaptation for climate changes will be developed. A forum for cross-sector coordination between public authorities will also be established.

  The strategy is available (so far only in Danish), at http://www.ens.dk/sw66173.asp

- **New national energy plan 2008-2011.** A new plan for the production of energy in Denmark was politically decided in February 2008. Important elements are the target of reducing the overall energy consumption in 2011 with 2 % compared to 2006 and the target of having 20 % of the energy consumption 2011 based on renewable sources (wind, solar energy, biogas, biomass).

- **Bio fuels.** There are growing concerns about the negative ecological and environmental impacts of the EU-targets on 5.75 % and 10 % bio fuels (bio-ethanol, bio-diesel) to be used in the transport sector by 2010 and 2020.

  The lack of sustainable produced bio fuels has been criticised. Impacts on biodiversity, climate and local communities due to deforestation or change of land-use for growing crops for bio fuels can become serious on a global scale. On a national scale an increased demand for crop land for the production of bio fuels may put pressure on the biodiversity depending on the marginal farmlands, which today are important habitats for a number of plant- and animal-species, which no longer are able to survive in the intensively cultivated monoculture areas in the farmland.

- **Nordic co-operation.** Denmark co-operates with the other Nordic countries in the field of environment under the umbrella of the Nordic Council of Ministers. Relevant projects related to climate and biodiversity includes "Conservation of Nordic Nature in a Changing Climate" available at http://www.norden.org/pub/sk/showpub.asp?pubnr=2005:572

and the ongoing project "Nordic Climate Changes Indicators of Effects on Nature" (further information from project leader Maria Mikkelsen, consultant, Ministry of the Environment, Agency for Spatial and Environmental Planning, Denmark (e-mail: ann@blst.dk).

- **National Environmental Research Centre (NERI), University of Aarhus.**

NERI implements a number of research projects including several in Greenland and other parts of the Arctic, which are targeting effects of the climate changes on various aspects of biodiversity, a list of ongoing projects can be found at http://www.dmu.dk/Samfund/Klimaaendringer_miljoe/Projekter/

- **Upcoming events:**

  International conference: ***Biodiversity Informatics and Climate Change Impacts on Life.***

  Venue: ***University of Aarhus, Denmark. April 5-6, 2008.***

  Conference website: http://www.danbif.dk/conference2008/

- *Nordic conference:* ***One small step – includes theme on biodiversity and climate change.***

  Venue: Odense. Denmark. September 15-17, 2008.

  Conference website: http://www.odense.dk/WEB1/onesmallstep/

Contact:

Mr Hans Skotte Møller
Senior Advisor, M.Sc.

Danish Ministry of the Environment
Agency for Spatial and Environmental Planning
Haraldsgade 53
DK 2100 Copenhagen Ø
Denmark. e-mail: hsm@blst.dk

6. FRANCE / FRANCE

Travaux engagés sur l'adaptation de la biodiversité au changement climatique

La prise en compte des impacts du changement climatique sur la biodiversité, et l'adaptation à ces impacts, représentent un enjeu majeur pour la France. La France est en effet située, pour sa partie métropolitaine, au carrefour de plusieurs zones biogéographiques et à la frontière entre Sud et Nord de l'Europe ; de plus, l'outre-mer français, support d'une très forte biodiversité, est constitué en grande partie d'îles et sous des latitudes tropicales, ou intertropicales et sera fortement touché par le changement climatique : montée du niveau de la mer, variations de température des eaux, mais aussi variations dans la fréquence et l'amplitude des événements cycloniques par exemple.

Face à cet enjeu que représente l'adaptation de la biodiversité au changement climatique, deux axes de travail sont actuellement engagés en France :

1. Comprendre et caractériser les impacts du changement climatique sur la biodiversité et déterminer les stratégies d'adaptation pertinentes en conséquence

- Des programmes de recherche dédiés ont été mis en place depuis 2003 afin de comprendre, de caractériser et de prédire les impacts du changement climatique sur les différents compartiments de la biodiversité, et notamment sur les espèces et les écosystèmes. Ces travaux permettent notamment de mieux identifier les modifications de composition et de fonctionnement de communautés ou d'écosystèmes en réponse aux variations climatiques de leur environnement (citons par exemple les coraux, les zones humides, les forêts, les réseaux trophiques marins, etc). Des études de modélisation ont également été réalisées afin de projeter les aires de répartition potentielles de plusieurs centaines d'espèces de faune et de flore à l'horizon 2050 et 2100 selon les différents scénarios climatiques du GIEC ; ces projections sont en train d'être affinées afin de mieux prendre en compte les caractéristiques écologiques et les capacités de migration des espèces d'une part, et la gestion des incertitudes d'autre part.

  Une nouvelle stratégie de recherche conjointe est à présent déclinée sur les bases de ces premiers résultats par l'Institut français pour la biodiversité - plate-forme nationale de recherche interdisciplinaire dans le domaine de la biodiversité - en particulier pour progresser sur les aspects prospectifs et l'évolution du fonctionnement des écosystèmes et des services écosystémiques[1].

- Des systèmes d'observation des changements climatiques et de leurs impacts sont également en cours de construction, en lien avec l'Observatoire national des effets du réchauffement climatique (ONERC) : ainsi, des indicateurs sont spécifiquement développés pour suivre l'impact du changement climatique sur les oiseaux, et ont vocation à être complétés par des indicateurs portant sur d'autres groupes[2]. Des indicateurs sur l'évolution des températures et du niveau de la mer sont également en cours de déploiement pour l'outre-mer.

  Des observatoires ont aussi été mis en place, comme l'observatoire **éco-climatique qui a été monté dans le Vercors** (Alpes) avec une association des gestionnaires des aires protégées locales avec des laboratoires universitaires afin d'analyser les changements climatiques et leurs impacts en zone de montagne. L'objectif de l'observatoire est d'étudier de manière transversale les évolutions climatiques (via des stations météorologiques), la ressource en eau, et la biodiversité. Outre l'intérêt de l'approche interdisciplinaire, l'observatoire occupe une position particulièrement intéressante car il est situé à la rencontre des trois régions biogéographiques.

  La première évaluation de l'état de conservation des espèces et des habitats d'intérêt communautaire au titre de la directive Habitats, faune, flore a par ailleurs permis de constituer une base d'informations sur les espèces et les habitats pour lesquels le changement climatique est un facteur d'impact avéré ou potentiel, ce qui permettra une réflexion opérationnelle sur le traitement de celui-ci dans le cadre de Natura 2000.

[1] *http://www.gis-ibf.org*
[2] *http://www.environnement.gouv.fr/-Presentation,640-.html*

- Certains milieux ou territoires font enfin l'objet d'études spécifiques, notamment les zones de montagne pour lesquelles il est d'ores et déjà possible de dégager un ensemble de constats cohérents sur les impacts du changement climatique et de définir ainsi des pistes d'adaptation. La forêt a également fait l'objet d'analyses poussées débouchant sur des propositions de stratégie d'adaptation opérationnelle. Enfin, le Conservatoire du littoral est fortement impliqué dans le projet européen BRANCH[3] qui porte sur les systèmes d'aménagement de l'espace littoral pour une adaptation aux changements climatiques.

2. Préparer l'adaptation de la biodiversité au changement climatique

La stratégie française d'adaptation au changement climatique (juillet 2007) comporte un volet consacré à l'adaptation de la biodiversité[4]. La stratégie nationale pour la biodiversité (2004) permet également une prise en compte des impacts du changement climatique sur la biodiversité même si celui-ci est peu mentionné explicitement, notamment à travers ses volets sur la protection des espèces, des milieux sensibles et la constitution d'un réseau écologique national[5].

Sur ces bases, plusieurs chantiers sont lancés ou en cours de lancement pour préparer l'adaptation de la biodiversité au changement climatique :

- **faire connaître et approprier la nécessité de cette adaptation**

L'Observatoire national des effets du réchauffement climatique a réalisé plusieurs documents à l'usage des collectivités territoriales afin de les accompagner dans la mise en place de stratégies d'adaptation au changement climatique, y compris concernant la biodiversité même si ce thème reste à développer[6].

D'autres documents d'information et de communication, à l'usage des collectivités et des gestionnaires, ont également été réalisés, concernant en particulier la forêt. Une stratégie d'adaptation des forêts au changement climatique est également en cours de finalisation en France : elle visera d'une part à valoriser le rôle des forêts comme régulateur du changement climatique et tampon de leurs effets, et d'autre part à proposer des pistes de prise en compte des impacts du changement climatique sur la biodiversité forestière.

Plusieurs événements soutenus ou initiés par l'Etat à destination des scientifiques et des gestionnaires ont eu ou vont avoir lieu pour partager l'information sur les impacts du changement climatique sur la biodiversité et dégager des pistes d'adaptation : colloque 2007 de l'Institut français de la biodiversité qui a fait un nouveau bilan des recherches en cours et de leurs implications, colloque sur les îles, la biodiversité et le changement climatique qui aura lieu début juillet sur l'île de la Réunion dans le cadre de la Présidence française du Conseil de l'Union européenne, congrès à venir de France nature environnement (fédération d'associations de protection de la nature) sur le thème des continuités écologiques et de leurs rôles dans le contexte du changement climatique.

- **en identifiant et en favorisant les continuités écologiques sur le territoire et une gestion adaptative**

Certains projets Life + ont permis d'avancer sur la gestion adaptative et le sujet des espaces protégées dans le contexte du changement climatique (projet porté par l'Office national des forêts notamment).

Au-delà du partage d'informations et de la mise à disposition de tous de pistes d'outils pour prendre en compte, aux différentes échelles, les besoins d'adaptation de la biodiversité au changement climatique, un chantier d'envergure nationale a été lancé sur la constitution d'une trame « verte et bleue » visant à assurer la continuité écologique sur le territoire.

Cette trame verte et bleue, qui est l'un des aboutissements du Grenelle de l'environnement organisé en 2007, sera un outil d'aménagement du territoire, constitué de grands ensembles naturels et d'éléments de connectivité les reliant ou servant d'espaces tampons et complété par une trame bleue

[3] *http://www.branchproject.org/achieve/optionscoast/normandyfrance/*
[4] *http://www.environnement.gouv.fr/IMG/pdf/Strategie_Nationale_2.17_Mo-2.pdf*
[5] *http://www.environnement.gouv.fr/Strategie-nationale-pour-la,7338.html*
[6] *http://www.environnement.gouv.fr/-Publications-et-colloques-.html*

formée des cours d'eau et masses d'eau et des bandes végétalisées généralisées le long de ces cours et masses d'eau. Cet outil vise ainsi à créer une continuité territoriale, et sera la déclinaison du réseau écologique paneuropéen ; il s'inscrira notamment dans la perspective de l'adaptation au changement climatique en favorisant les déplacements des populations et les flux de gènes. La trame verte et bleue sera pilotée localement en association avec les collectivités locales et en concertation avec les acteurs de terrain dans un cadre cohérent défini par l'Etat. Certaines collectivités ont déjà constitué une telle trame sur leur territoire ou sont en train de le faire[7].

[7] *http://www.legrenelle-environnement.fr/grenelle-environnement/spip.php?rubrique140*

7. GERMANY / ALLEMAGNE

Report from the German Federal Agency for Nature Conservation

INFORMATION ON RECENT/ONGOING INITIATIVES AND ACTIVITIES RELATED TO BIODIVERSITY AND CLIMATE CHANGE IN GERMANY

A) Research projects

There is a number of ongoing research projects at the national level which aim to enhance the knowledge base for climate change adaptation related to biodiversity.

The project "Modelling the impact of climate change on plant distribution in Germany" is nearing completion. First results from the projections of future distribution patterns of about 550 vascular plant species in Germany under three different climate scenarios until 2080 are available at: http://www.ufz.de/index.php?en=6536. The projections were undertaken by an ecological niche modelling approach.

The project "Protected Areas in Germany under Global Change – Risks and Policy Options" is ongoing and set to run until July 2009. This project will produce among other things ecological risk assessments with regard to the conservation targets of selected protected areas in Germany and aims to formulate concrete steps towards necessary adaptations, also at the national scale. So far, methods have been developed for the modelling of habitat changes and for assessing risks to species, regionalised climate scenarios have been developed for the selected protected areas and modelling of plant and bird distributions has been undertaken. More information is available at: http://www.pik-potsdam.de/forschung/aktuelle-forschungsfelder/klimawirkung-vulnerabilitat/vme/schutzgebiete/index_html?set_language=en.

The project "Invasive species and climate change in Germany and Austria" is carried out in collaboration with the Austrian Umweltbundesamt (Federal Environment Agency Austria). This project aims to produce a list of species which are or might become problematic under climate change as well as to set up the basis for an early warning system. It is set to run until early 2009. Further information can be obtained from Mr. Franz Essl, e-mail address: franz.essl@umweltbundesamt.at.

A number of further research projects are dealing with the impacts of the increasing use of renewable energies on biodiversity.

Several new project ideas, including an analysis of legal aspects of climate change adaptation for biodiversity, the development of target group-oriented communication strategies, the development of strategies for the consideration of adaptation needs in spatial planning and the elaboration of monitoring concepts, are currently being discussed.

In addition to projects carried out at the national level, relevant research activities are also undertaken at the level of the federal states. There is no complete overview on these activities, although many have been listed in response to a questionnaire sent out by the Federal Environment Ministry in the course of information gathering for the National Strategy for Adaptation to Climate Change (see below). For example, studies summarizing and analyzing (*inter alia*) available data on observed and projected impacts of climate change on biodiversity have been carried out or are ongoing in the states of Baden-Württemberg, Bavaria, Brandenburg, Hessen, North Rhine Westphalia, Saxony and Schleswig-Holstein.

B) Development of strategies

At the federal level, a National Strategy for Adaptation to Climate Change is currently being developed. The process is coordinated by the Federal Environment Ministry and the strategy is expected to be drawn up and consulted upon by the end of this year. Nature conservation will be one of the sectors considered in the strategy.

The NGO project "Climate change and biodiversity – a communication strategy for non-professionals engaged in nature conservation", which is supported by the Federal Environment

Ministry, aims to raise awareness on the consequences of climate change for nature conservation and to establish a dialogue with private conservation activists on the possible ways forward. The project is set to run until autumn 2008, the project homepage (in German) is to be found at: http://www.nabu.de/m06/m06_12/06172.html.

Several of the federal states are in the process of developing regional adaptation strategies for their own territories. For example, a strategy paper outlining possibilities for adaptation to climate change in various sectors (including nature conservation) has been published in North Rhine-Westphalia in September 2007. In the state of Baden-Württemberg, the development of recommendations for the adaptation of nature conservation strategies to climate change is undertaken in a project within the context of the development of the regional sustainability strategy. The development of strategies for adaptation as part of an integrated approach to dealing with climate change is ongoing *inter alia* in Bavaria, Brandenburg and Saxony.

March 5, 2008
Cordula Epple
Federal Agency for Nature Conservation

8. LATVIA / LETTONIE

RECENT ACTIVITIES ON BIODIVERSITY AND CLIMATE CHANGE IN LATVIA

I. The policy documents:

- The Climate Change Mitigation Programme for 2005-2010 was elaborated and approved in 2005; mainly aiming at reduction of emissions and use and development of different types of energy resources;
- A new Climate Change Adaptation Policy is under preparation;
- The National Environmental Policy Plan (containing chapters "Climate Change" and "Biodiversity") is also under preparation. The Policy Plan will be approved by the Government till the end of 2008 and is planned that it will also aim to minimize the clash between biodiversity conservation and climate change mitigation measures.

II. Projects

- The Faculty of Geography and Earth Sciences of the University of Latvia as a partner was involved in the INTERREG III B project "Developing Policies & Adaptation Strategies to Climate Change in the Baltic Sea Region" (ASTRA) (2005-2007). The main objective of the project was to assess regional impacts of the ongoing global change in climate and to develop strategies and policies for climate change adaptation. The project's documents and publications are available at www.astra-project.org

III. Researches

Several researches were and are being done on climate change and its impact, major of them:

- National Research Program „Climate Change Impact on Water Environment in Latvia" (http://kalme.daba.lv) starting from 2006. Scientists in Latvia have joined forces to investigate how climate change will potentially influence Latvian lakes, rivers and the Baltic Sea coast and coastal waters, and to elaborate scientifically justified proposals to adapt to and mitigate adverse impacts;
- Publication „Climate Change in Latvia" (2007) contains 18 articles on three main topics: the character of climate change, the impacts of climate change and climate policy and technologies (publication supported by the above mentioned ASTRA project and National Research Programme);
- The main interest of the State Forest Monitoring Programme for 2008 is to explore the impact of climate changes to forest ecosystems, forest biodiversity status and changes as well as to forest soils. Responsible – the Ministry of Agriculture, State Forest Service and Latvian state Forestry Research Institute "Silava";
- Project of the Latvian Ornithological Society in 2006 "Development of unified data base of spring migratory birds' phenology". The unified data base will ensure systematic storing of data, possibilities for analysis and comparison with meteorological data, which may point to climate changes and its impact to bird fauna in Latvia during the last century;
- Project of the Latvian Ornithological Society in 2006 "Identification of development zones of wind power systems and elaboration of mitigation measures". As a result of the project the map with zones showing territories where development of wind power stations is prohibited or should be strictly evaluated was prepared for Kurzeme (western part of Latvia) for the protection of migratory and nesting birds.

9. NORWAY / NORVÈGE

A Norwegian strategy for climate change adaptation will be developed (spring 2008). The strategy is going to be an overall strategy and is part of a national climate adaptation programme which started in 2007 and will go on for up to 5 years. The Ministry of Environment chair the work in which the most relevant ministries/sectors (12 ministries) are involved. The secretariate of the programme is located in the Directorate for Civil Protection and Emergency Planning (below the Ministry of Justice and Police). A website will be published in June.

NorACIA (2005-2009) is a Norwegian national following up of Arctic Climate Impact Assessment, published in 2004. This project is going to publish a regional assessment (in 2009) of predicted climate changes, impacts on ecosystems and biodiversity as well as impacts on sectors and society, and adaptation proposal for the most northern areas in Norway. Link to webpage in Norwegian: http://acia.npolar.no.

VACCA - Vulnerability and Adaptation to Climate Change in the Arctic is an Arctic Council project. A 2 step project: 1) database with acitivities and projects going on in the arctic countries, and 2) workshop 22.-23.10.08. Project leader in Norwegian Polar Research institute. Link to webpage: http://portal.sdwg.org/content.php?doc=58&xvm=true

The Research Programme "Climate Change and Impacts in Norway" (2004-2013). http://www.forskningsradet.no/servlet/Satellite?cid=1088796719038&pagename=norklima%2FPage%2FHovedSideEng. The programme contains research to enhance knowledge about the climate and promote a better interface between different types of research to give society a stronger platform for dealing with changes in global climate – as a basis for adaptive responses by human society. Project catalogue in English. 17 new projects from January 2008, including about 7 concerning biodiversity.

Climate change and adaptation in nature management.
The Directorate for nature management (DN) has recently published 3 reports

- Framstad; E. et al: Effects of climate change on ecosystems and biodiversity. DN utredning 2006-2 (in Norwegian with English abstract)
- Directorate for nature management 2007. Climate change – adaptation and measures in nature management. DN-report 2007-2b. http://www.dirnat.no/content.ap?thisId=500031941&langauge=0
- Haugan, P. et al. 2006. Effects on the marine environment of ocean acidification resulting from elevated levels of CO2 in the atmosphere. DN utredning 2006-1. http://www.dirnat.no/content.ap?thisId=500013099&language=0

DN has also published a climate effect database on studies/results on climate change effects on biodiversity (in Norwegian). DN also work to strengthen the national monitoring programmes on biodiversity to improve the climate change aspect of the monitoring activites. Our palsa mire monitoring programme and also repeated vegetation analyses at GLORIA (mountain) sites (in 2008 compared to 2001) are of special interest with respect to climate change effects.

10. SERBIA / SERBIE

Ministry of Environmental Protection of the Republic of Serbia

REPORT ON CLIMATE CHANGE AND BIODIVERSITY IN THE REPUBLIC OF SERBIA

Bearing in mind that researches of biological diversity have a long and very rich tradition in Serbia, in this report presents some of the important recent and ongoing activities and project results related to the increase impact of climate change on biodiversity.

Despite the great diversity of different taxa, the process of biodiversity erosion is marked, not only in Serbia but in wider regions of Balkan peninsula. Many species disappeared from Serbia, and some rare species are endangered to alarming limits. Human induced pressures on habitats (urbanization, development of agriculture, industry, mining, transport infrastructures) resulted in:

- degradation of natural ecosystems to cultivated agro-ecosystems, sylvicultures or (sub)urban area,
- fragmentation of habitats
- overexploitation of genetic and biological resources
- introduction of alien species from remote areas
- contamination of air, water and soil by toxic, mutagenic or cancerogenig pollutants
- induced climate changes

In this context, Republic of Serbia has signed and ratified several international agreements focusing on the treatment of global warming. Many of those agreements outline the principle and legal and economic instruments that could slow down climate change. By adopting the Law on Ratification of Montreal Protocol on Substances that Deplete the Ozone Layer (16/90, and 24/04) our state was actively involved in the programmes aimed at protecting the stratospheric ozone. The Law on Endorsing the United Nations Framework Convention on Climate Change , as wall as, the Kyoto Protocol, and the Combat on Desertification Convention, and the Bern Convention, and the Bon Convention were adopted 2007.

National climate change observation and research activities as fundamental base for monitoring of impact climate change on biodiversity

In the framework of its jurisdiction, Republic Hydrometeorological Service of Serbia (RHMSS) carries out the national program for systematic monitoring, analyzing, forecasting and research of the weather, climate and water, air and water quality, and national program of early notification and warning against the occurrence of atmospheric and hydrological disasters and climate extremes as well as accidental air and water pollution. Development and research activities are carried out within the scientific-technical Programs of the World Meteorological Organization (development and application of numerical weather and climate models, applied meteorological and hydrological research, climate change research etc.).

RHMSS also participates in the realization of national implementation programs of relevant international conventions and protocols (UN Framework Convention Climate Change, UN Convention on drought and desertification, UN Convention on Biological Diversity etc.).

RHMSS, in cooperation with other stakeholders in the implementation GEF/UNDP project "Capacity building activities for the creation of the First national communication of Serbia for the UN Framework Convention on Climate Change", now in preparation, plan to carry out research program in the part dealing with the climate change impacts assessment on forestry and other ecosystems,

vulnerability research and assessment of options for adaptations of the economic activities, natural and human systems to climate change.

A number of major projects for capacity building is either in progress or planed to make RHMSS more efficient in performing its functions and tasks in the field of climate change monitoring and research are listed below.

List of ongoing or planned international research and development projects relevant for the assessment of climate change impacts on biodiversity and habitats at the national and local level
UN/ISDR PROJECT "Assessment of needs for capacity building of RHMS" within the Regional project of International strategy for mitigation of natural catastrophes in coordination with WMO
Project under bilateral Technical cooperation program with Italy "SINTA: Simulations of Climate Change in the Mediterranean Area"
Project on establishment of CLIDATA System for climate database management under WMO Program for technical cooperation
Project "Upgrading of measuring system and registering of hydrological data through the introduction of new technologies" in cooperation with Norwegian Directorate for Water and Energy-NVE
Project "Design and optimization of national network of hydrological stations in Serbia" in cooperation with Norwegian Directorate for Water and Energy-NVE Project "National forecasting system for medium and minor basins" in cooperation with Norwegian Directorate for Water and Energy - NVE

Results of the recent observation and research activities in the field of forest biodiversity and climate change

Climate influences the composition, structure, and function of forest ecosystems, the amount and quality of forest resources, and the social values associated with forests, native forests are adapted to local climatic features. Climate variability and change are examined by looking at four key issues: forest processes, disturbance, biodiversity, and socioeconomic impacts. These categories represent key interactions between a changing climate, forest structure or function, and human interactions with forests.

Climate and land use are the two major factors controlling biological diversity. Species richness generally increases with increasing air temperature and precipitation. As climate changes during the this century, biological diversity will also change. Under all of the climate scenarios, many of parts of forest types in Serbia will migrate.

The region of Serbia is characterised by the wealth of forest communities, lowland, upland, mountainous and sub alpine forests, and the unique forest ecosystems with a great number of endemic species of trees, shrubs and ground flora.

The big magnitude of biological diversity in Serbia is caused by biogeographically position openness of territory in accordance with the other (neighbouring) regions, and to historical processes of genesis of flora and genesis of fauna during the long history.

Except part of Panonia lowland on the north, the most parts of territory of Serbia are situated on Balkan peninsula, which is one of the "hot" points in regard to centres of biodiversity in Europe.

On the region of Serbia there are three biomes: Sub-Mediterranean as part of Mediterranean, middle-European and ponts-southsiberian. with help of elevation zoning of mountain`s ecosystems, there are elements of boreal, Middle-European mountain`s (including alp`s) and the South-European mountain`s biomes. It is estimated that there are about 1000 plant communities in Serbia. Balkans endemic species consist 8,06% of flora of Serbia (287 taxons), and local endemic species 1,5% (59 species). Numerical and diversity of fauna, also, is very high.

Based on the typological definition of the space occupied by forests, about 160 forest types were identified within the main coeno-ecological co-ordinate system composed of seven complex forest types.

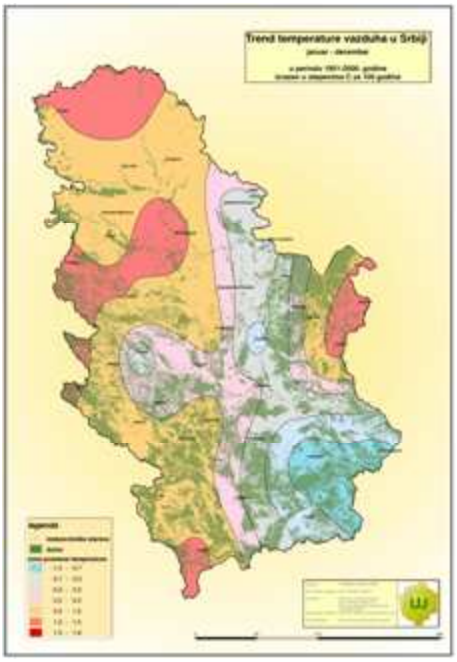
The major forest complexes are:

- complex of alluvial - hygrophilic forest types,
- complex (belt) of xero-thermophilic hungarian oak – turkey oak and other forest types,
- complex (belt) of xero-mesophilic sessile oak and hornbeam forest types,
- complex of mesophilic beech and beech - conifer forest types,
- complex (belt) of thermophilic pine forests (orno-ericion) on a series of soils on basic rocks,
- complex (belt) of frigoriphilic conifer forest types,
- belt of subalpine shrubby conifers and broadleaves.

Picture 1: The inventory of forests in Serbia includes : 79 tree species, 184 forest types, 662 variations stand units which are also often anthropogenically conditioned

Serbia`s forests are undergoing rapid change due to a warming climate and large-scale disturbances. These changes has been exacerbated by management policies and practices resulting in forest simplification.

In Serbia, the mean annual temperature is expected to increase up to 4-6°C on the and of 21st century. If the temperature increase is substantial, droughts, insect infestations and fires could become more likely, and forest cover loss may occur and persist while the new forest types migrate north. If the average global temperature increase is 2°C over the next 100 years, tree species will have to migrate 2-5 km every year, exept for trees whose seeds are spread by birds.



Pictures 2 and 3:

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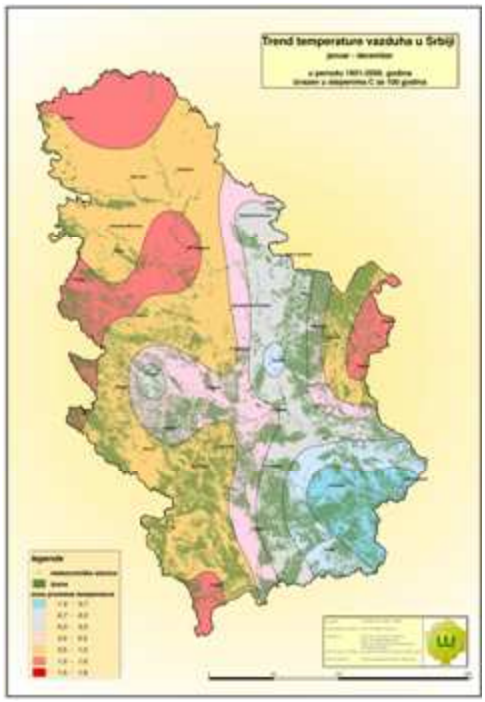
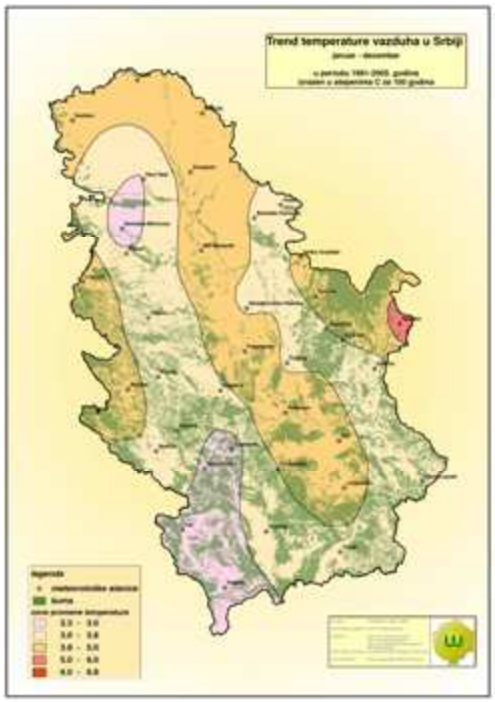
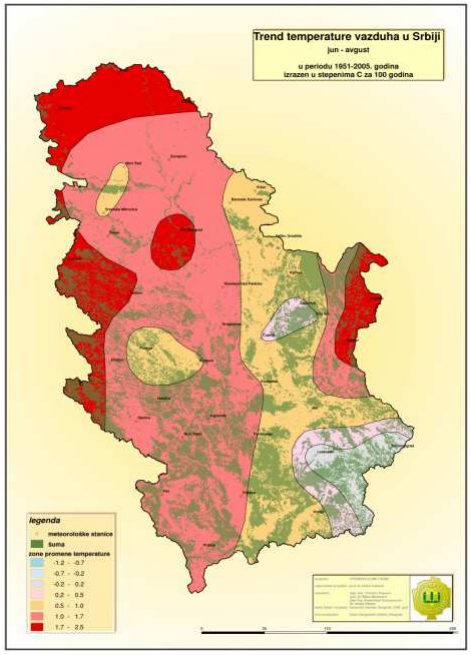




Pictures: 4 and 5:

While the effect of changes in tree compositions on other species is difficult to predict with the modeling tools currently available, plants and animals that live in the forest will be affected, both by changing habitat and in direct response to temperature increases and changes in precipitation, fire regimes, and storm events. It is unknown as yet whether biological diversity would be reduced if

climate change occurred at a fast rate, but the new composition of species is likely to be one of heat-tolerant fast adapters.



Pictures 6 and 7:
Wildlife has been able to adapt to changing climates for millions of years. But unlike during previous climate changes, roads, development and other changes to the natural environment now block their migration routes or otherwise impede their adaptations. Parks and nature reserves established to protect certain species may no longer be hospitable to those species.

Forest management has been advised to strongly promote changes that comply with current principles and measures aimed at enhancing the ecological stability of forests. The forests of the Serbia are already being weakened and endangered by a long-term increase in the different pressures. Precautionary measures to mitigate the effects of global climate change are, to a large degree, identical to measures for assuring the stability and viability of forests, even if no climate change occurs. Such measures are in harmony with approved state forestry policy, which abides by the principles of sustainable forest management, in the interest of current and future generations.

Forest processes and forest biodiversity are uniquely capable of providing goods such as:

- wood products,
- wild game,
- harvested plants,
- ecological services such as water purification, and amenities such as scenic vistas and wilderness experiences the socio-economic benefits of forests.

Changes in forest species composition, growth, and mortality alter the possible supply of specific types of wood products, wildlife habitat, and recreation. Clearly, forest changes caused by human use of forests could exceed those impacts from climate change.

However, climate change could impact many of the amenities, goods, and services from forests including productivity of locally harvested diferent plants and products; local economies through land use shifts from forest to other uses; forest real estate values; and tree cover and composition in urban areas, and associated benefits and costs.

Review of the Recent/Ongoing Projects on Biodiversity and Climate Change

1.Subproject « Climate Change and Sustainable Development of Forset Ecosystems in Serbia within the National Project «Sustainable Development and Protection of Forest Ecosystems in Serbia – Harmonization with International Standards" which is realized as a I Phase by the Faculty of Forestry University of Belgarde

2. Project Proposal "Impact of Climate Change on the Forest Biodiversity" is elaborated by the Ministry of Environmental Protection of the Republic of Serbia and Forest Faculty of the Belgrade University for IPA Funds.

This project will enable UNFCCC, Kyoto Protocol, UNCCD, UNCBD and NEAP implementation by strengthening capacities for monitoring effects of climate change on forest ecosystems biodiversity in Serbia

The overall goal:

–to improve state of forestry in Serbia and describe most likely impacts of climate change and its consequences for forest management, timber production and biodiversity with the risk assessment

Specific objectives:

- Establishment of the system of monitoring of climate change on forest ecosystem biodiversity -Establishment of the system of forest protection and reforestation and afforestation of forest related to the decrease impact of climate change on forest diversity
- Defining concept and measures of the adaptation management of forest ecosystems related to the of forest ecosystems related to the climate change

Expecting results:

- Identifying common interest/areas in the region, stronger regional and international cooperation on forest and climate change issues, develop a common technological base
- Defining models of effects of climate change impact on forest ecosystems in Serbia
- Established the system of monitoring of the state of forest related to the decrease impact of climate change on forest diversity and water resources
- Built capacities of institutions/human resources for monitoring and protection of forest for implementation of landscape typology

Follow up activities

As a first step towards harmonisation of the regulations in the area of the nature protection and biodiversity, as well as towards the implementation of Bern convention and CBD, several important international projects have been started and are in progress in this field.

- Elaboration of the National Strategy on Sustainable Development
- The National Environmental Action Plan is established by the Government of the Republic of Serbia
- The National Strategy for Sustainable Use of Natural Resources and Goods
- The National Strategy of Biodiversity Conservation and Action Plan
- The Law on Nature Protection – Harmonization with EU regulations

Future work for developing Emerald network in the Republic of Serbia will greatly benefit from information and reasrch trough the UNDP projects such as Biodiversity Strategy, and other ongoing programmes targeted protected areas.

Creating terms for accessing to future work on Natura 2000 in Serbia several projects are developed:

- ✓ Harmonisation of national nomenclature for classifying of habitats with International community standards

- ✓ Project " Development of the EMERALD Network in the Republic of Serbia"
- ✓ Inventory of marshlands and wetlands in Republic of Serbia
- ✓ Important plant areas (IPAs) in Serbia
- ✓ Important bird areas (IBA)
- ✓ Action Plan on Invasive Alien Species Control in the Republic of Serbia etc.

Belgrade, March, 2008.

11. SPAIN / ESPAGNE

CLIMATE CHANGE AND BIODIVERSITY IN SPAIN: IMPACTS, VULNERABILITY AND ADAPTATION

Bastos Araujo, M.; Felicísimo Pérez, A.M.; Gómez Calmaestra, R.; Gutiérrez Teira, A.; Picatoste Ruggeroni, J.R.; Villalba Alonso, C.J. [8]

INTRODUCTION

The *UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE*, in its article 4.1b, states that all Parties to the Convention shall *"formulate, implement, publish and regularly update national programmes containing measures to facilitate adequate adaptation to climate change"*.

Spain signed the Convention in June 1992, the ratification took place on December 1993 and it has entered into force on March 1994.

The ECCE PROJECT (*A preliminary assessment of the Impacts in Spain due to the effect of Climate Change*, 2005) was the first national evaluation of climate change effects in Spain. It was developed by a group of more than 400 experts in different ecological systems, and economic and social sectors. The ECCE project dealt with the impacts of these projected climate changes on 15 sectors and systems.

The NATIONAL PLAN FOR THE ADAPTATION TO CLIMATE CHANGE (NPACC) is the reference framework for the coordination of all activities related to the evaluation of impacts, vulnerability and adaptation to climate change in Spain.

The NPACC, promoted by the *SPANISH CLIMATE CHANGE BUREAU (MINISTRY OF ENVIRONMENT)*, was presented in February 2006 to the *ENVIRONMENTAL SECTORAL CONFERENCE* (administrative body that embodies the cooperation between Central Government and Autonomous Communities in environmental policy issues), and has been approved by the relevant national participation and coordination bodies dealing with Climate Change: *NATIONAL COMMISSION FOR THE COORDINATION OF CLIMATE CHANGE POLICIES* (Administrations) and the *NATIONAL CLIMATE COUNCIL* (Administrations and stakeholders) in July 2006.

Its main objective is the integration of the adaptation to climate change in the planning strategy of, initially, fifteen sectors and systems through a series of Work Programmes. Under the first Work Program, the priority sectors and activities considered are the generation of regional climate scenarios and the evaluation of the impact of climate change in water resources, coastal areas and biodiversity.

CLIMATE CHANGE AND BIODIVERSITY IN SPAIN: IMPACTS, VULNERABILITY AND ADAPTATION

The MINISTRY OF ENVIRONMENT started in 2006 the preparation of a project to assess the impacts of climate change on biodiversity and to make informed decisions on practical adaptation actions and measures.

The project –started in January 2008 and with a planned duration of two years– involves the participation of the *UNIVERSITY OF EXTREMADURA* (flora species and habitat types) and the *NATIONAL MUSEUM OF NATURAL SCIENCES-CSIC* (fauna species).

The main objective of the project is to assess the impacts and vulnerability of biodiversity to climate change, as well as the adaptation measures required to prevent biodiversity loss related to

[8] Miguel Bastos Araujo. Museo Nacional de Ciencias Naturales (CSIC). maraujo@mncn.csic.es
Angel Manuel Felicísimo Pérez. Universidad de Extremadura. amfeli@unex.es
Ricardo Gómez Calmaestra. Dirección General para la Biodiversidad. Ministerio de Medio Ambiente. rgcalmaestra@mma.es
Alfonso Gutiérrez Teira. Oficina Española de Cambio Climático. Ministerio de Medio Ambiente. agutierrez@mma.es
Jose Ramón Picatoste Ruggeroni. Oficina Española de Cambio Climático. Ministerio de Medio Ambiente. jrpicatoste@mma.es
Carlos Javier Villalba Alonso. Universidad de Extremadura. villalba@terrae.net

climate change. For this purpose, representative series of habitat types, flora and fauna taxa, are being selected taking into consideration relevant criteria for biodiversity conservation like geographic distribution, conservation status, degree of threat, etc.

In order to evaluate the effect of climate change on biodiversity, the territory has to be analyzed not only in terms of its *current natural characteristics* (elements, structure and natural processes), but considering also the *potentiality of what the territory can house*.

Land cover and vegetation maps, as well as biodiversity inventories and other natural resources information, provide us with a general scope of *current* biological richness. But it is also necessary to estimate the *predicted situation in the future*, incorporating the projected change(s) provided by different climate scenarios and predicting future species and habitat types distributions. This is considered a very important issue, especially in areas like the Iberian Peninsula where all climate change models predict substantial variations in biodiversity limiting factors, like rainfall regime or maximum temperatures.

The project can be differentiated in two main working lines:

- ✓ Development and application of methodologies to assess climate change impacts on biodiversity (APPLIED INVESTIGATION)
- ✓ Promotion of participation mechanisms for relevant partners like Public Administrations, researchers/academic institutions, NGOs, etc. and development of information campaigns (COMMUNICATION AND PARTICIPATION)

APPLIED INVESTIGATION

It comprises the application of statistical modelling and spatial analysis techniques aiming to:

- Assess the potentiality of the territory to house flora and fauna taxa and relevant habitat types.
- Assess the expected changes in this potentiality under several climate change scenarios for the XXI Century.
- Evaluate changes in biodiversity distribution patterns along different time horizons of the XXI Century and identify species turnover rates, including the identification of areas of persistence, disappearance and colonization.

  It is important to highlight that the assessment of biodiversity changes in response to climate change is an evolving field of work, and it entails some constraints:

  - First, neither biological data nor the simulations required to evaluate the nature and extension of future changes in ecosystems and taxa distribution are still complete, so the predicted effects can only be partially assessed.
  - Second, in the current state-of-the-art of predictive habitat and species distribution modelling techniques, the species-climate envelope modelling approach –also known as ecological niche modelling– has been widely used to support estimates of species' extinction risk under climate change; despite the fact that other important influences related to biological factors (i.e. dispersion, interactions among living organisms, habitat fragmentation) and antrhopic factors (i.e. changes in land use, pollution) can not be fully assessed.

In this context, the proposed approach has to be seen as a *first step* to assess the complex response of biodiversity to climate change, but in the light of current scientific knowledge, it is considered appropriate: (1) to evaluate biodiversity vulnerability to climate change, (2) to estimate the expected impacts of climate change on our natural heritage and (3) to identify those biodiversity elements that can be more seriously threatened by climate change. Results of this project are intended to provide decision-makers with tools to facilitate the priorisation of actions and to assess adequate adaptation measures.

The key activities to be developed under this working line are:

1. Selection of biodiversity elements (flora and fauna taxa and habitat types) representative of Spanish biodiversity, taking into consideration conservation status and degree of threat.

2. Development and integration of nationwide geographic databases of current taxa and habitat types potential distributions, environmental variables –including bioclimatic variables both for present-day and future climate scenarios–, protected areas, land use and infrastructures, etc.
3. Application of statistical modelling methods to project spatial shifts in potential species and habitat types distributions according to different climate change scenarios
4. Identification of biodiversity distribution patterns –both at present-day and in the different climate change scenarios– and of species turnover rates, including the identification of areas of persistence, disappearance and colonization
5. Assessment of the interaction between the impacts of climate change on biodiversity and land use planning considering –for instance– connectivity, habitat fragmentation, etc.
6. Proposal of adaptation measures to reduce the impact of climate change on biodiversity, including the identification of priority fields for further investigation and research.

COMMUNICATION AND PARTICIPATION

It comprehends the development –in parallel to Working Line 1: Applied Investigation– of communication campaigns and participation processes with relevant agents involved in biodiversity management, research, investigation, monitoring and public awareness.

Spain is characterised by a highly decentralised administrative system, where Autonomous Communities (Regional Governments) have significant regulatory and management powers, including biodiversity and nature conservation. In this context, the Central Government and Regional Governments are obviously the main agents due to their responsibility in biodiversity management, but the scientific and academic community (researchers and scientists) and the Non-Government Organizations are also relevant ones, taking into consideration their role in investigation, research and monitoring, and public awareness. Besides, specific actions to inform stakeholders will also be implemented.

The objective of this working line is to promote the participation of these agents by means of the development of a communication strategy, the promotion of inter-disciplinary working groups and discussion forums where project development and results can be presented and adaptation measures can be discussed.

The key activities to be developed under this working line are:

1. Presentation of the project at its first stages to relevant administrative and scientific bodies, and to the media.
2. Establishment of participation mechanisms with the administrative authorities and scientific community, aiming to inform on project development and to promote synergies with related initiatives.
3. Dissemination of the results of the project and starting of a wide debate for the assessment and discussion of adaptation measures in the framework of current biodiversity management policies, priorities for investigation and research and need of reconsideration of environmental and sectoral policies in light of the predicted impact of climate change on biodiversity.

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12. SWEDEN / SUEDE

Dnr 126-1907-08 Nl

F-67075 STRASBOURG Cedex -
France

Sweden facing climate change – threats and opportunities, SOU 2007:60

The final report from the Swedish Commission on Climate and Vulnerability was published in October 2007. The Swedish Government appointed the Commission in June 2005.

The Commission has analysed how the climate of Sweden may develop over the next hundred years. Important aspects that have been investigated are vulnerability to floods, landslides and storms. Terrestrial, marine and freshwater ecosystems will face great upheavals, and the loss of biodiversity may increase. The commission propose various measures to reduce vulnerability and adapt society to long-term climate change and extreme weather events.

The report: http://www.sweden.gov.se/content/1/c6/09/60/02/4b04b42e.pdf

Biological diversity and climate changes – What do we know? What do we need to know? What can we do?

The Swedish Biodiversity Centre (CBM) has made a report in 2007 on different aspects of climate change and biodiversity. It includes published knowledge as well as interviews with scientists, officials and people working practical with nature conservation. The report is an enclosure to the final report from the Swedish Commission on Climate and Vulnerability (more information above).

CBM points out that effects of climate change on biodiversity must be determined in relation to other effects, above all land use and economization of nature resources. Land use that is negative for biodiversity today will continue to be so even in a changed climate. The conservation work on biodiversity should therefore not be narrowed down to focus on the effects of climate change only. Instead we need to be aware and prepared for additional problems linked to climate change, for example changes in cultivation. An important conclusion of the report is that changes in cultivation due to climate change could have larger impacts on biodiversity than the climate change itself.

The report: http://www.cbm.slu.se/publ/annat/bmochklimat.pdf

Effects on biodiversity in a changing climate in Stockholm

The local authority in Stockholm has made a report on the effects of climate change on biodiversity in the area of Stockholm. It is based on published knowledge as well as interviews with scientists, officials and consultants.

The report describes the knowledge of today as well as the additional knowledge and analyses that will be needed to adapt the city to the climate change and effect on biodiversity. For example, new requirements and system-boundaries will be necessary in management and administration of natural areas.

The report

http://www.stockholm.se/upload/Fackforvaltningar/Miljöförvaltningen/Vaxthuseffekten/Pdf/Anpassning/Biologisk%20mångfald.pdf

Nordic nature management in a changing climate

The Nordic Council of Ministers has made a report in 2005 that describes how the climate and nature may develop in the Nordic Region south of the Arctic Circle in the next 100 years. The report also describes how effects of climate changes can be integrated in nature conservation and management.

The report: http://www.norden.org/pub/miljo/miljo/sk/TN2005571.pdf

Ongoing activities at the Swedish Environmental Protection Agency

Climate change is a priority area at the Swedish Environmental Protection Agency. Potential risks have been mapped to get a general view of potential vulnerabilities to climate changes in the working area of the Nature Department. For examples, we need to be more alert on the status of species depending on cold water, how the saltiness in the Baltic Sea develop and how the tree line develop on high mountains.

13. TURKEY / TURQUIE

NATIONAL REPORT OF TURKEY

Turkey has been a party of United Nations Framework Convention on Climate Change (UNFCCC) since 2004. The Ministry of Environment and Forestry (General Directorate of Environment Management), acting as the national focal point to the UNFCCC is the leading governmental agency for all issues related to climate change in Turkey.

The most important activities on climate change and biodiversity in are as follows:

Turkey's Climate Change Coordination Committee was established by the Turkish Government in 2001. This Committee has 8 working groups composed of Government Institutions, NGO representatives, Universities. Working Group's Reports include climate change potential future effects on agriculture, ecosystems, fisheries, water resources, diseases (Leptospirozis, Malaria...etc.), forestry, and climate scenarios, mitigation and adaptation options, measures…etc.

For more information :www.iklim.cevreorman.gov.tr, www.meteor.gov.tr

Conference on Climate Change was arranged by the Ministry of Environment and Forestry in 2004. Government Institutions, International Institutions, UNDP and NGO representatives, Universities have participated to the Conference. The agenda contains *Past, Present and Future Global Efforts on Climate Change,* Perspectives for International Cooperation on Climate Change, Scientific Bases of Global Warming and Climate Change, *Fundamentals and Modelling of Global Climatic Variability*, Observed Changes in Turkey's Climate, Environmental, Social and Economic Consequences of Climate Change, *Impacts and Adaptation to Climate Change*, / Estimations and Projections of GHG Emissions, Land Use, Land Use Change and Forestry, Agriculture and Waste, Integration of Rural Development Projects into Mitigation of Greenhouse Gases, *Climate Friendly Farming*, New and Renewable Sources of Energy, Global warming, responsible and measures to be taken..etc. (For more information :www.iklim.cevreorman.gov.tr)

First National Communication of Turkey on Climate Change was completed in 2006. This report contains climate change, vulnerability assessment and adaptation measures, climate change scenarios, sea level rise and coastal implications, assessment of impacts and adaptation measures (impact of climatic changes on water resources, agriculture, marine ecosystems and fisheries, terrestrial and freshwater ecosystems, wetlands, special protection areas and biodiversity, health (Malaria and Leptospirosis Cases, Crimean Congo Hemorrhagic Fever), national greenhouse gas inventories and mitigation scenarios and measures, awereness raising…etc. (Coordinated by: Ministry of Environment and Forestry, Implemented by United Nations Development Program (UNDP), Turkey. Funded by the GEF Project for Preparation of First National Communication of Turkey to UNFCCC-Global Environmental Facility-UNDP National Communication Support Program) (Second National Communication of Turkey on Climate Change will be completed 2009.)

For more information :www.iklim.cevreorman.gov.tr, www.meteor.gov.tr

Biodiversity Strategy and Action Plan Preparing Project was prepared by the The Ministry of Environment and Forestry (General Directorate of Nature Conservation and National Parks) and completed in 2007. Project duration was 18 months. This Action Plan contains determination and monitoring of climate change, potential future effects on biodiversity and taking measures to prevent the climate change effects on vulnerable species and ecosystems. For more information : www.bcs.gov.tr.

Forestry Strategy and Action Plan Workshop was held in 2007. Forestry Strategy and Action Plan will be developed by the The Ministry of Environment and Forestry (General Directorate of Forestry) Climate change took place as a threat factor for forestry in this Action Plan. For more information : www.ogm.gov.tr/strateji

Fisheries Expert Group Report was published in 2007 containing climate change potential future effects on fisheries. (in Turkish only)

Meetings on Climate Change :

(For more information :www.iklim.cevreorman.gov.tr)

The Effects of Climate Change of Turkey and Industry (2005) NGOs and Climate Change Forum (2006)

The First National Congress on Climate Change (2007)

Climate Change, Drought and Water Management Symposium (2007)

Congress on Climate Change and Environmental Effects (2007)

A workshop was held in October 2007 entitled **The effects of Climate Change on Aquatic ecosystems**. (For more information: http://www.limnology.metu.edu.tr/page=events.php)

The Projects:

(The outputs of the following projects took place in First National Communication of Turkey on Climate Change)

- **Climate change Scenarios for Turkey**. This report includes the results of research on climate change in Turkey during the last century and developments in climate change projections made at the Eurasia Earth Sciences and Informatics Institutes of the İstanbul Technical University: (For more information: www.iklim.cevreorman.gov.tr, www.meteor.gov.tr)
- **Modeling for Climate change effects in the Gediz and Büyük Menderes River Basins**. Hydrologic systems and water resources are likely to be seriously affected by global climate change and the purpose of this study is to provide preliminary assessment of such impacts for the Gediz and Büyükmenderes Basins. (Dokuz Eylül University Water Resources Management Research Center (SUMER) İzmir, Turkey)

  (For more information: www.iklim.cevreorman.gov.tr, www.meteor.gov.tr)
- **Effects of climate change on the ecosystem of Büyük Menderes.**

  The benthic macroinvertebrate assemblages broadly reflect environmental conditions and are used as indicators of environmental degradation and restoration. Multivariate methods permit considerable understanding of the community structure and relationship with corresponding environmental properties. (Hacettepe University)

  (For more information: www.iklim.cevreorman.gov.tr, www.meteor.gov.tr)
- **Correlation between Temperature, Rainfall and Leptospirosis Incidence in İstanbul, Turkey**.

  This study aims at providing preliminary assessments regarding the possible impacts of global climate change on the force of leptospira transmission.

  (For more information: www.iklim.cevreorman.gov.tr, www.meteor.gov.tr)
- **Correlation between Temperature, Rainfall and Malaria Incidence in Turkey**.

This is an interm report on the investigation of the relation between temperature and rainfall changes and malaria incidence in Turkey.

(For more information: www.iklim.cevreorman.gov.tr, www.meteor.gov.tr)

- **Impact of global climate change on lake ecosystems in Turkey**.

  This study aims to investigate the impacts of global climate change on the hydrological and ecological characteristics of the naturally formed large lakes including Lake Beyşehir, Tuz and Van. (Funding Agency: The Scientific and Technological Research Council of Turkey (TÜBİTAK)

  (For more information: http://www.limnology.metu.edu.tr/page=events.php)

Promoting Climate Change Policies in Turkey :

Project Partners : Ministry of Environment and Forestry (Turkey), REC Turkey, Exergia (Greece), co-financor; Italian Trust Fund (Italy)

Project Aim and Objectives **:**-Building capacity related to Climate Change within national administration, promote intra-governmental cooperation,-Increasing the awareness of societal actors and improve their role in Climate Change debate,-Supporting the development of Climate Change policies for priority sectors, enhance public participation and access to environmental information(For more information : www.rec.org.tr)

- **Capacity Building For Stakeholders And Government in Climate Change :** Target Group :Government experts, National administration, Non-Governmental Organizations (NGOs)

  Project Aim and Objectives : The overall project objective is to facilitate the involvement of the Turkish government and key stakeholders (business, environmental and academia community) in participating at the climate change activities at national and international level. (For more information : www.rec.org.tr)

- **Climate Change Public Awareness Campaign in Turkey** : Target Group **:**General Public

  Project Aim and Objectives : To increase awareness and understanding of the climate change concept in general public. (For more information : www.rec.org.tr)

- **Promotion of Zerocarboncity Campaign in Turkey** : Target Group **:** General Public Project Aim and Objectives :To facilitate dissemination of British Council ZeroCarbonCity campaign inTurkey. (For more information : www.rec.org.tr)

- **CEMRE (REC Turkey Climate Change Bulletin)** : Cemre publishes 1000 copies and three isues in a year. Each issue involves articles and news on some topics; Changing Climate, Mitigating Climate Change, Climate Change and REC, Climate Change and Turkey, Cover Story, Agenda of UNFCCC, Kyoto Protocol, Glossary, natural and anthropogenic greenhouse effect…e.t.c. (For more information : www.rec.org.tr)

Climate Change Action Plan Project Facilitating Workshop was held in 2007. **: (**Enabling Activities for the Preparation of Turkey"s Initial National Communication to the UNFCCC : Second National Communication of Turkey on Climate Change) Ministry of Environment and Forestry General Directorate of Environment Management will coordinate this project. UNDP is acting as the implementing agency.The project will be working under a priority area / category selection approach in order to allocate resources in the most effective manner. The *main components* of the project are: an inventory of greenhouse gases for the year 1990-2003, analysis of potential measures to abate the increase in greenhouse gas emissions in Turkey; an assessment of potential impacts of climate change in Turkey and adaptation measures; assessment of cost and benefits of various energy policy alternatives on climate change; capacity building in the areas of scientific and technical potential and institutional relations infrastructure and data network for information and data acquisition to enable the development of national communications in Turkey on a continuous basis; preparation of the INC of Turkey and submission to the COP. In addition, public awareness activities and stakeholder consultations will be cross-cutting along the overall course of this exercise. Project duration is twelve months. (Second National Communication of Turkey on Climate Change will be completed 2009.)

For more information :www.iklimnet.org, www.iklim.cevreorman.gov.tr

Informative Web links about climate change:

www.iklim.cevreorman.gov.tr, www.iklimnet.org
www.cevreorman.gov.tr with link Gazi University web page
www.meteor.gov.tr.
www.rec.org.tr.
http://www.tema.org.tr/CevreKutuphanesi/KureselIsinma/KureselIsinma.htm
www.wwf.org.tr/iklim-degisikligi

14. UNITED KINGDOM / ROYAUME UNI

NATIONAL REPORT OF UK

Policy Instruments

The **UK Climate Change Bill** was introduced to Parliament in November 2007. The Bill will create a new approach to managing and responding to climate change in the UK through: setting ambitious targets, taking powers to help achieve them, strengthening the institutional framework, enhancing the UK's ability to adapt to the impact of climate change and establishing clear and regular accountability to the UK, Parliament and devolved legislatures. The Bill should become law by the end of 2008. www.defra.gov.uk/environment/climatechange/uk/legislation/index.htm

On January 29 2008, the Scottish Government published a consultation which sets out proposals for a **Scottish Climate Change Bill**. The Bill is intended to create a long-term framework for the current and successive administrations in Scotland to ensure that carbon emissions are cut by 80% by 2050. www.scotland.gov.uk/Publications/2008/01/28100005/0

The Department for Environment, Food and Rural Affairs (Defra), on behalf of the UK Biodiversity Partnership, have published (May 2007) a report setting out six guiding principles to reduce the impacts of climate change on biodiversity and how to adapt existing plans and projects in the light of climate change. "**Conserving biodiversity in a changing climate: guidance on building capacity to adapt**" www.ukbap.org.uk/library/brig/BRIGGuidanceWebpdf.pdf

The England Biodiversity Strategy, Climate Change Adaptation workstream (the EBS CCA) is developing a set of **adaptation** principles which will be applied across all sectors of the EBS. This work builds on options outlined in the report: "**England Biodiversity Strategy- Towards adaptation to climate change"** published in May 2007. www.defra.gov.uk/wildlife-countryside/resprog/findings/ebs-climate-change.pdf. The adaptation principles will be published this summer and embedded across the EBS by the end of 2008.

At the 8th CoP on CMS the UK reported on the strength of links between climate change and migratory species' behaviour, abundance and distribution. As a result CMS parties called for more research on the subject. In May 2007 Defra commissioned a study "**Climate Change Indicators for Migratory Wildlife**" a response to a call for further research at the 8th CoP of CMS the work is being led by a consortium of research institutes (the British Trust for Ornithology with Centre for Environment, Fisheries and Aquaculture Science; Centre for Ecology and Hydrology; Swansea & Aberdeen Universities). This study aims to identify a set of species whose attributes can act as indicators of likely climate change impacts on the range of migratory species; and to develop standardised international protocols for monitoring the effects of climate change on populations of these migratory indicator species. A report is due to be delivered in May 2008.

Publications

A report of the meeting: "**Biodiversity–climate interactions: adaptation, mitigation and human livelihoods**" organised by the Royal Society in partnership with the Global Environmental Change Committee, Global Biodiversity Sub-Committee (GBSC) has been published (Feb 2008). http://royalsociety.org/displaypagedoc.asp?id=29026

The Marine Climate Change Impacts Partnership (MCCIP) has published an "**Annual Report Card 2007-2008**" (Jan 2008). This provides a comprehensive assessment of UK marine climate change impacts; the underlying evidence and predicted changes to the marine environment and its biota. www.mccip.org.uk/arc/2007/default.htm

The Environment Agency has published (May 2007) the results of a study designed to model how climate change might affect river-dwelling organisms. "**Preparing for climate change impacts on freshwater ecosystems (PRINCE)**" http://publications.environment-agency.gov.uk/pdf/SCHO0507BMOJ-e-e.pdf?lang=_e

A Climatic Atlas of European Breeding Birds (2007). Brian Huntley , Rhys E. Green , Yvonne C. Collingham , Stephen G. Willis. Published as a partnership between Durham University, the RSPB and Lynx Edicions in association with the University of Cambridge, BirdLife International and EBCC. www.hbw.com/lynx/en/books-on-birds/paleartico/ALT0007-climatic-atlas-european-breeding-birds.html

The Environment Agency and Countryside Council for Wales have published (May 2007) a report "**Climate proofing rural resource protection policies and strategies in Wales**" Researchers at the University of Wales in Bangor used projected climate and socio-economic scenarios for 2020 and 2050 to investigate how six natural resource policies, strategies and plans would affect a case study area in the River Usk Catchment. http://publications.environment-agency.gov.uk/epages/eapublications.storefront/47cd25960074c0962740c0a8029606d2/Product/View/SCHO0407BMGV&2DE&2DE#

The Joint Nature Conservation Committee (JNCC), with funding from the Overseas Territories Environment Programme of the Foreign and Commonwealth Office, have contracted The Caribbean Natural Resources Institute (CANARI) to produce a range of outreach materials on **Climate Change: Adaptation, Mitigation and Ecosystem Services in the UK Overseas Territories** (UKOTs). Material produced will include a series of booklets and multimedia products, including a dedicated website.

The **UK Climate Impacts Programme** website: www.ukcip.org.uk presents much of the work being done in the UK to understand the relationships between biodiversity and climate change.

Deborah Procter
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