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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Standing Committee

34th meeting
Strasbourg, 2-5 December 2014

Group of Experts on Biodiversity and Climate Change

Strasbourg (19 June 2014)

NATIONAL REPORTS

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/
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ALBANIA / ALBANIE

REPUBLIKA E SHQIPËRISË
MINISTRIA E MJEDISIT

Albania Country Report

Expert group meeting on biodiversity and climate change
Strasbourg, 19 June 2014

There are obvious interconnections between climate change and biodiversity. Despite this statement the possible mutual benefits between climate change mitigation and adaptation and biodiversity conservation within projects are not always fully recognized and addressed.

Developments in Albania since the last report include:

- ✓ The GEF funded UNDP project on **"Adaptation and Mitigation measures for the area between Drin-Mati river deltas"** was completed in July 2013. A concrete contribution of the project for this vulnerable coastal area is the adaptation and mitigation measures for the Kune-Vaini area, which was added as an Annex to the management Plan prepared in 2010 for this Protected Area. The annex was officially recognized as a part of the Management Plan by Ministerial Order in 2013. Another measure was the planting of sand dunes in identified areas of the wetland as a pilot action for the area;
- ✓ **The Third National Communication of Albania to the UNFCCC** is under preparation in the context of a GEF-UNDP project. This report includes major findings and achievements of the Drin-Mati project regarding biodiversity and climate change addresses in the course of the above-mentioned project implemented for a 5 year period in Albania;
- ✓ In April 2013 a **Strategic Document for the Development of the Coastal and Protected Areas** for the country to 2020, was elaborated, with the support of the GEF-UNDP project "Improving coverage and management effectiveness of Marine Protected Areas" in Albania. This study analyzed and proposed potential coastal and marine protected areas to be designated also taking into account the climate change vulnerability scale and classification of these areas. Kune-Vaini wetland complex was one of the areas proposed to be extended in the future into the marine area to better accommodate and address climate change risks.
- ✓ In the document **Revision and Update of the National Biodiversity Strategy and Action Plan** (NBSAP) to 2020, in line with Aichi targets of the CBD, is on-going, biodiversity and climate change issues are addressed in a dedicated section. The document is expected to be finalized in July and is planned to be approved by the Council of Ministers until the end of 2014;
- ✓ **The National Environment Cross-cutting Strategy**, the final draft of which is just completed, has a separated chapter on Climate Change. In this Chapter the issues and the vision related to biodiversity and climate change issues are elaborated.

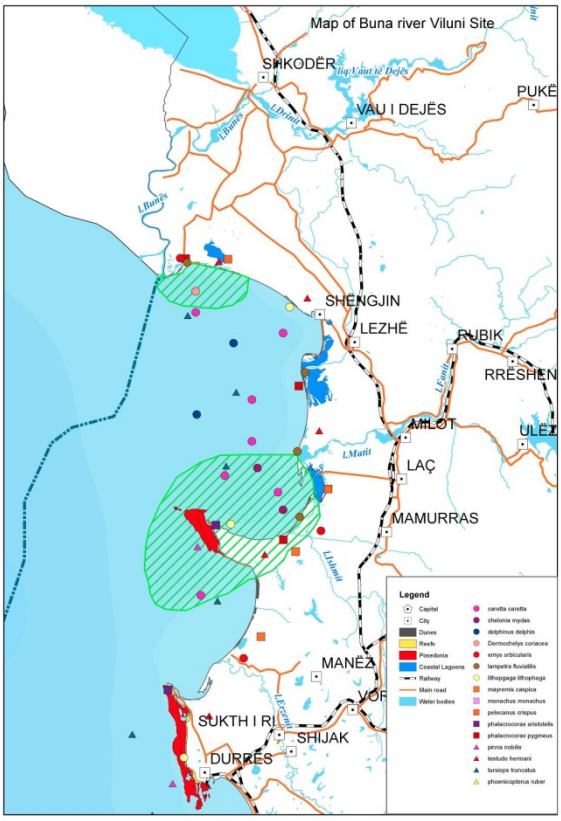
Plans for the future

- ✓ In the framework of **IPA 2013 for Albania**, approved and planned to start in September 2014 the National Climate Change Strategy will be prepared for the first time in Albania. According to the ToRs this document will also contain a section dedicated to relations and issues of biodiversity and climate change;
- ✓ Development of the UNEP-MoE GEF SCCF Project Document *"Building the resilience of Kune-Vaini Lagoon through ecosystem based adaptation (EbA)"* is on-going since March this

year and to be completed by September 2014. The project funded by GEF-UNEP of a total amount of 2 million USD is planned to start in the beginning of 2015 and will be focused on the implementation of the measures and activities that will contribute to the building of the resilience in Kune-Vaini Lagoon based on the Ecosystem based Adaptation Approach, in this Managed Nature Reserve.

Annexes to this report

Annex 1 – Map of Kune-Vaini Managed Nature Reserve



Annex 2 – Map of proposed extension of future MCPA-s in Albania

ARMENIA / ARMÉNIE

REPORT ON IMPLEMENTED WORKS BY THE REPUBLIC OF ARMENIA BIODIVERSITY AND CLIMATE CHANGE

NATURAL ECOSYSTEMS AND BIODIVERSITY

Terrestrial ecosystems

This year, Armenia is finalizing preparation of the 3rd National Communication under the Climate Change Convention /UN FCCC/. Based on the successful cooperation established between the Bern Convention and UNFCCC implementation teams, the UNDP Climate Change Programme kindly provided draft materials of the Vulnerability and Adaptation Chapter of the 3rd National Communication. In the frames of further enhancing synergic activities between two Conventions, was conducted the climate change risk assessment of the "Emerald Network" sites in Armenia in 2013. The assessment results and recommendations for risk reduction will be included in the corresponding chapter of the 3rd National Communication. The assessment was planned and financed jointly by CE and UNDP projects. We also plan to deepen cooperation between two Conventions through developing and publishing materials that will illustrate joint-work results and further cooperation development trends (second half of 2014).

Similar cooperation with Convention of Migratory Species and initial agreement is reached with Armenian Coordinator of CMS.

Special studies on the evaluation of climate change impacts on natural ecosystems and their separate components are implemented in recent years in Armenia. Especially, works are being done on alpine vegetations (in the frames of Gloria International Network).

The "Assessment and development of conservation measures of environmental factors' impacts on the plant species included in the Red Book of Armenia" research (2011-2013) was implemented in the Institute of Botany of the National Academy of Sciences of Armenia, which resulted in predictions and evaluations of Armenia's most rare flora population species' threats due to the expected climate changes in Armenia.

A joint "Genetic heterogeneity and taxonomic state of hardly identifiable groups of invasive phytophagous insects in the conditions of current climate change (synthesis of molecular biological, cytogenetic and morphometric approaches)" Armenian-Belarusian study was implemented in the Scientific Center of Zoology and Hydroecology, in the frames of which the different populations of beetles were examined and their adaptation opportunities during the changing climatic conditions were evaluated. The Armenian "REC-Caucasus" continues to implement the «Identification and Implementation of Adaptation Response to Climate Change Impact for Conservation and Sustainable Use of Agro-biodiversity in Arid and Semi-arid Ecosystems of South Caucasus» program, during which the vulnerabilities of ecosystems and agro-biodiversity of Vayots Dzor and Ararat regions were evaluated, moreover, their conservation and sustainable measures were developed.

Massive works are carried out by the "GreenLine" Ngo within the Caucasus Environmental NGO Network (CENN). In particular, in the frames of "Enhancing Local Capacity and Regional Cooperation for Climate Change Adaption and Biodiversity Conservation in Georgia and the South Caucasus" program a "Global Climate Change and South Caucasus" book was prepared and afterwards was used in trainings and seminars in Lori region of Armenia in order to introduce the climate change issues to teachers and middle school pupils. In 2013, the "Sustainable management of pastures and forest in Armenia to demonstrate climate change mitigation and adaptation benefits and dividends for local communities" EU/UNDP program launched. This program is directed to conservation and restoration of the most vulnerable and degraded high mountain ecosystems (pastures and meadows) and forest ecosystems. The aim of the program is to integrate the environmental and social issues in the management of upper watershed basins, to restore natural ecosystems, to create a favorable environment to ensure a sustainable management of forests and upper mountain ecosystems,

as well as to adopt effective rules of agricultural management, which can reduce a pressure on ecologically vulnerable areas and can cut carbon emissions.

WWF-Armenia currently has two pilot programs which are directly related to forest ecosystem climate change adaptation problems: “Increasing the resilience of forest ecosystems against climate change in the South Caucasus Countries through forest transformation” and “Forest landscape restoration of Northern Armenia”,

In the Institute of Botany of the National Academy of Sciences of Armenia the ecosystem modelling changes are used, based on the “Holdridge Life Zones” system, for the implementation of many studies. Based on climate change forecasts the corresponding predictions on “bio climate” changes and main ecosystem changes were developed.

Alpine meadows - A completely change of all conditions into sub-alpine tall grasses and wetlands is predicted.

Sub-alpine meadows - A transfer into meadow-steppes is predicted, meanwhile, an expansion of forest ecosystems is possible.

Steppes – Dry steppes will be replaced with phryganoids, tragacanth steppe areas will expand. The mesophile steppe ecosystems will be replaced by more dry variants.

Meadow-steppes - A transfer into a steppe ecosystems is more expected, in specific cases (in some areas in case of the precipitation amounts increase), a development of sub-alpine tall grasses is possible, as well as, sometimes is more expected an expansion of forest ecosystems, which are the current meadow areas.

Semi-deserts - Basically, the semi-desert vegetation conservation with the expansion of phryganoid areas is supposed to happen. An expansion of desert ecosystem areas (particularly saline deserts and “solonchaks”) is also expected.

Shibljak and open forests - Overall, these ecosystem conditions will maintain the same and will even expand a little bit, but the growth of trees and bushes can deteriorate and these ecosystems, especially in the middle mountain belts, can be replaced by phryganoids over time.

Forest ecosystems

In middle altitudinal belt’s “humid” forests, most probably, xerophyte processes will be observed; for instance, penetration of the typical steppes, arid open forests and shibljak plant species. A partial xerophytization of “wet” forests will lead to their transformation into “humid” forests. Current forests of sub-alpine belts will be replaced with common “wet” forests over time; an increase of the forest vegetation upper border will take place.

Forest ecosystems are unequally distributed in Armenia. 62.5% (207 thousand ha) of forests is located in north eastern, 13.5% (45 thousand ha) in the middle, 2.4% (8 thousand ha) in the southern and 21.6% (72 thousand ha) in the south eastern regions. Armenia is rich with various forest types with different structures and compositions.

Within the USAID activities, it turned out that, because of the climate change conditions, the main threats for forest ecosystems would be the changes in their boundaries due to the development and expansion of other ecosystems, and, as well, massive spread of forest fires, diseases and pests. Consequently, if adaptation measures are not implemented until 2030th, a forest loss of about 14 - 17.5 thousand ha can be registered. The first adaptation was tended to the “Adaptation to Climate Change Impacts in Mountain Forest Ecosystems of Armenia” UNDP-GEF program, within which both special additional researches in Southern Armenia (Syunik region), and restoration measures of forest ecosystems affected by fires and human activities were initiated.

Afforestation and forest restoration works were implemented on 57 ha territory by aborigine species of trees and bushes, in particular juniper, eastern oak, maple and osier species. Besides, the forest damage levels from different damagers were evaluated, the fight guide against them was developed, as well as, the biological methods to fight against them were used on 500 ha territory during the recent years in Armenia. Some measures have already been implemented in Armenia to

prevent the increase of forest fires that can take place because of the expected climate changes, as these fires are considered to be one of the most dangerous factors for forest ecosystems of Armenia.

Armenia takes part in OSCE and in many other regional projects financed by European Union, such as “Streams suppress fires” program that has a purpose to develop a cooperation circle which will evaluate forest fire risks and will also develop their preventing measures for different types of forests.

Forecasts of changes of most significant ecosystems included in SPNA’s

Specially protected nature areas (SPNA’s) are very important for the conservation of ecosystems and biodiversities. Within the recent years, it became obvious, that the existence of maximum number of natural ecosystems with good conditions in SPNA’s, as well as in “Emerald Network” is the most important adaptation measure for natural ecosystems and for separate plant and animal species. The vulnerability evaluation of some SPNA’s of Armenia is given below. Some of these areas are among of “Emerald Network” sites.

“Khosrov forest” State reserve - included in the “Emerald Network”

A deterioration of the forest vegetation’s growing conditions can be expected. In the lower mountain belts forests will transfer into sparse forests. Overall, the natural growth of forest trees will be hampered. Probably, the upper border of the forest will rise to the sub-alpine belt. The presumed changes of ecosystems will lead to the conservation and improvement of bezoar goat’s natural habitats, as well as, an improvement of the existence conditions of water shrews is very likely. The existence conditions of mouflons and crested porcupines will significantly deteriorate. Climate change won’t have a noticeable impact on populations of panthers (Panthera pardus).

“Shikahogh” State reserve

A gradual change of oak (Quercus macranthera) species to Georgian oaks can be expected. Deciduous oak park-forests will expand in sub-alpine belts. Meanwhile, forests will be replaced to sparse forests and shibljak in the lower belt (with the dominance of araxian oaks (Q.araxina)). Due to the expected ecosystem changes, the living conditions of black grouses, bezoar goats, water shrews and long-eared hedgehog will improve. A good fodder base will be created for marbled polecats and for wild cats (Felis silvestris) as a result of intensive spread of small rodents and sparrows. Favorable survival conditions will remain for snowcocks and panthers.

“Erebuni” State reserve

The whole steppe vegetation is expected to remain the same; more spread of effusive species is possible (for example, Carthamus turkestanicus). Most likely, Aegilops will become widespread; the varieties of wild wheat (Triticum) will probably decrease. Can be expected that Eastern spadefoot will disappear from the territory of this reserve.

“Lake Arpi” National Park- included in the “Emerald Network”

The sub-alpine meadows with successions should be replaced by meadow-steppes and later by steppes. The wetlands will probably remain unchanged. Good conditions can be created for the Asia Minor ground squirrel - Spermophilus xanthoprymnus to penetrate into the national park’s area. The existence conditions of Transcaucasian water shrew - Neomys schelkovnikovi, Eurasian otter - Lutra lutra, Dalmatian pelican - Pelecanus crispus, Corncrake - Crex crex, Vormela peregusna – marbled polecat, Armenian sea-gull – Larus armeniacus, great cormorant -Phalacrocorax carbo, Glossy ibis - Plegadis falcinellus will also improve. The existence conditions of Black stork - Ciconia nigra and Common crane - Grus grus will deteriorate.

“Lake Sevan” National Park and its buffer zone- included in “Emerald Network”

Sub-alpine meadows will be replaced by meadow-steppes in most parts of the national park’s area. However, an expansion of sub-alpine tall grasses and woody vegetations, especially the sub-alpine curved-trunk forests is also possible. The open forests (junipers and leaf forests) will remain, but some issues can arise related to their natural growth. The living conditions of local populations of Caucasian black grouse - Tetrao mlokosiewiczi, Bezoar goat - Capra aegagrus and Vormela peregusna

– marbled polecat will improve in the buffer zone of the national park. The gray cranes as well as two species of pelicans will not nest here, yet they will be more seen during their migration or eating periods. The conditions of Armenian sea-gull - Larus armenicus, Great cormorant - Phalacrocorax carbo and Pygmy cormorant - Phalacrocorax pygmaeus, Ferruginous duck - Aythya nyroca will improve.

"Dilijan" National park – included in the "Emerald Network"

A forest vegetation change is possible because of the transformation of "humid" forests into the "wet" forests: beech forest expand, wider spread of Georgian oak forests comparing with Eastern oak forests, the hornbeam will continue to spread, while the Carpinus orientalis forests will remain predominantly only in the affected natural habitats. Because of the climate and ecosystem changes, the living conditions of local populations of Caucasian black grouse - Tetrao mlokosiewiczi, Transcaucasian water shrew - Neomys schelkovnikovi, brown bear - Ursus arctos and Wild cat - Felis silvestris will improve in the territory of national park.

"Arevik" National Park

A forest ecosystem transfer into sparse forests is expected in the lower mountain belt; Araxian oaks' (Q.araxina) dominance is possible. Overall, a change of deciduous oak (Q.macranthera) types into Georgian oaks (Q.iberica) will take place. Sub-alpine meadows will transfer into meadow-steeps. The living conditions of black grouses, water shrews, bezoar goats, desert partridges (Ammoperdix griseogularis) and snowcocks will improve in the territory of national park. Most probably, the survival conditions of crested porcupines and panthers will maintain. The living conditions of mouflons will deteriorate.

"Khor Virap" Reservation - included in the "Emerald Network"

The climate change won't have a direct impact on this site, but, because of the water regime change in the site, a deterioration of the conditions can be possible. On the one hand, the predicted rainfall rate decrease can bring worse conditions. On the other hand, the increase of the irrigation water demand and the modern irrigation system's opportunities in the Ararat valley's surrounding sites can provide the site with the required quantity of water.

"Aragats Alpine" State Reservation - included in the "Emerald Network"

The main impacts of the predicted climate changes can influence on alpine meadow vegetation. A general way of conditions change is envisaged not for sub-alpine meadows, which could be assumed, but for the expansion of sub-alpine meadows or tall grasses and wetlands. A penetration of aggressive species can be considered as a threat for rocky natural habitat types.

"Khustup" State Reservation - included in the "Emerald Netwotk"

As a result of the forest's growing conditions improvements, the Eastern oak forests from Quercus macranthera will expand in sub-alpine belt and will penetrate into the site. The meadows will expand more in deforested parts, and the steppe vegetation presumably will be replaced by shiblyak. Together with the expected ecosystem change, the existence conditions of Caucasian black grouse - Tetrao mlokosiewiczi will improve, it's areal will expand and population state will improve. The living conditions of Bezoar goat - Capra aegagrus, Long-eared hedgehog - Erinaceus auritus, Transcaucasian water shrew - Neomys schelkovnikovi will also improve. Due to more intensive spread of rodents – Rodentia and sparrows – Passeridae, a good forages base will generate for marbled polecat - Vormela peregusna and for wild cat - Felis silvestris. For Cerambyx cerdo of the invertebrates, the living conditions can be expected to have some improvements. Related to the rise and the change of species of the forest's lower border, a deterioration of growing conditions is expected for those tree species (oak) which are considered as main food. Consequently, the number of weak and semi-dry trees will increase, which will lead to the additional micro-biotopes for the development of the Cerambyx cerdo.

"Lori lakes" - included in the "Emerald Netwotk"

An ecosystem change is not expected, but the predicted rainfall decrease can contribute to the lakes' water balance disturbance, which can make their surface smaller and deteriorate existence conditions of some species. In the result of the ecosystem surface minimization and hydrological regime change, a deterioration of the population state is possible particularly for the Vertigo angustior and Leucorrhinia pectoralis invertebrates.

"Shibljak" impassable brushwood

The predicted climate changes represent no threat to this area. Overall, shibljak can expand in the result of climate change. There is no direct threat to peony; because it is a spring species, a vegetation term change is possible.

"Plane Grove" State Reservation- included in the "Emerald Network"

Overall, the predicted climate change represents no threat to this area, but the expected water regime change can have a negative impact on the plane regrowth. The ecosystem will be totally preserved, while the surrounding forest ecosystems and the shibljak ecosystem are not supposed to be threatened.

"Gnishik" Protected Landscape - included in the "Emerald Network"

The main ecosystems will remain unchanged, but the little areas of sub-alpine and alpine meadows can transfer into meadow-steppes. A change of dominants and their distribution of areas can be observed in the steppe ecosystems. The open forests will remain the same, while the phryganoid areas will expand. Overall, the process of ecosystems' becoming more xerophyte and arid will take place.

"Ararat" Salt Marshes –AM- included in the "Emerald Network"

Climate changes will not influence on this site itself, but may increase the effect of anthropogenic impacts, such as overgrazing and artificial burning of natural ecosystem. The decrease of precipitation may influence on the level of underground water, which can indirectly influence on the conditions of the site.

Climate change risks on rare plant species

Climate change will first and foremost endanger plants that are rare and have narrow ecological amplitude. These plants can vanish in case of not finding a new suitable place for growing. There are 452 superior plant species represented in the Red Book of Plants of Armenia (2010), meanwhile, climate change is indicated as a main danger threatening a survival of 87 species in the territory of Armenia which have already been included in the Red Book.

The evaluation of possible changes in ecosystem showed that the expected climate changes will not have significant impacts on the 238 plants included in the Red Book of Plants of Armenia. In the result of climate change, the living conditions of 140 plant species will significantly improve. These plants are thermophilic plant species, for wider distribution of which the sum for effective temperatures is currently not enough. On the other hand, for 74 plant species, based on the modeling of ecosystem and growing area changes, the climate change risk can be a factor determining their survival in Armenia. First of all, these species are included in the group of plants which is adapted to near alpine and alpine zone conditions. As well, the freshwater representatives of over-humid growing areas of lower and middle mountain belts belong to the same plant group. The latter's growing area surface will considerably reduce. Besides, the climate change impacts will be great and real for mesophilic species of meadows, meadow-steeps and steeps. As a result of climate change, their few, inconsiderable or isolated populations will become more achievable.

Water ecosystems of Lake Sevan

Lake Sevan is the most important water basin in Armenia. Its ecosystems had been subjects of special studies for approximately 90 years. Because of strong anthropogenic impacts, there was a 20.2 meters water level drop in 2002, as a result of which the lake volume was reduced for more than 42%, leading to significant changes in the thermal regime of the lake. The average monthly water temperature of the lake rose by a quick temperature increase in summer and by a quick temperature loss in autumn. Recently, the lake level has risen 3 meters (since 2003), which leaded to few changes in the lake's ecosystem. However, it is unclear whether this tendency continues or the water level reduces again even for multiple times.

During the modern period, the water level increase is characterized as phytoplankton diversity decrease, as green-blue algae increase, and as species' unpredictable change (zooplankton and zoobentos undergone through qualitative and quantitative changes). According to the long-term examination results, it can be concluded that due to the influences of climatic factors the vulnerability of macrophytes will also increase in future. Accumulation places of macrophytes serve as habitats for invertebrates; consequently, if they vanish, fishes can lose their feeding places, which can negatively influence on nutritional status of fishes, on their reproduction cycle and breeding quality.

Although the production and quantities of fish species, overall, may be increased, with a change to warmer thermal regime the cold water fish species subsequently can be replaced with thermophilic species. In the expected temperature growth conditions the fragmented fish species will not completely disappear. Probably, with small groups fishes will find most suitable habitats for them, but, at least for a while, their breeding opportunities will decrease which will lead to deterioration in their biological and quantitative indicators.

Climate warming will have a positive impact on a total number of omnivorous thermophilic carp species. During their first year of life, carps have similar breeding types to the other mentioned fishes of the like. Especially, they have similarities with whitefishes and with common carps. When the carps become older they are more alike to the common carps and, probably, to the barbels. Together with their fast growth, these big feeding similarities of carps can lead to a reduction of availability of food for other local fish species.

Adaptation measures

Goal – conservation of biological diversity and ecosystems.

Type	Activity Name	Needs
Administration and Planning	Reduction of anthropogenic impacts on natural ecosystems	• Development, approval and implementation of the SPNA development strategy in Armenia • Development and approval of new management plans ("Dilijan" and "Sevan" National Parks, "Khosrov Forest" and "Shikahogh" State Reserves)
	Evaluation, development and monitoring of the existing SPNA's ecosystems and biodiversity.	Implementation of a program on biodiversity and ecosystem research in SPNA's.
	Conservation of existing rare growing areas.	Continuation of growing areas' separation works, which represent an environmental interest within the creation of "Emerald Network".
	An increase and stabilization of Sevan lake's level with a purpose of reproduction and conservation of ecosystems.	Implementation of continuing increase of the lake level till the approved level or implementation of stabilization measures to maintain the current level.
Research and Information	Evaluation of population state of rare plant and animal species (conduction of the Red Book).	According to "Flora" and "Fauna" laws, regular examinations should be implemented in order to make amendments in the Red Book.

	Examination of climate change impacts on separate species of ecosystems, flora and fauna.	Continuation and expansion of researches.
	Research and monitoring of plant and animal species invasive species' distribution.	A state research program for plants and animals.
	Research and monitoring of all main water ecosystems' state in Armenia.	Continuous monitoring of significant ecosystem indicators.
Economical and technical measures	Supervision of invasive species.	A state program on distribution of invasive species.
	Conservation of natural reproduction opportunities of the fish quantities.	Creation of fish holes during the construction of hydroelectric power stations and maintenance of sanitary flow during the whole year.
	Economical and efficient use of underground (artesian) water springs.	Use of closed-cycle management by fish breeding farms.
	Ex-situ conservation of rare plant and animal species.	Improvement of the state of existing collections.

Type	Activity name	Implemented (currently implementing) activities
Administration and Planning	Reduction of anthropogenic impacts on natural ecosystems.	RA Government decisions • A management plan of 22.12.2011, 1854 – Ա "Arpi Lake" National park, 2011-2015. • On the approval of; 15.10.2009 1187-Ն "Zangezur" reserve establishment; 15.10.2009 1209-Ն "Arevik" National park establishment. • Khustup and Zangezur
	Evaluation, development and monitoring of the existing SPNA's ecosystems and biodiversity.	• A research program operates in "Sevan" National Park; a new program is being prepared for "Khosrov Forest" State Reserve. • A RA Government decision is being prepared in order to make amendments in several RA laws with a purpose of environment, including biodiversity and ecosystems' monitoring establishment and quality improvement.
	Conservation of existing rare growing areas.	"Development strategy of Armenia's SPNA Network" is being developed.
	An increase and stabilization of Sevan lake's level with a purpose of reproduction and conservation of ecosystems.	A law on "Sevan Lake".
Research and Information	Evaluation of population state of rare plant and animal species (conduction of the Red Book).	Researches are partially implemented in The Institute of Botany of the National Academy of Sciences of Armenia.
	Examination of climate change impacts on separate species of ecosystems, flora and fauna.	Examinations are implemented within the thematic, basic and international researches of "Gloria" International Network, as well as of the NAS institutions of RA.
	Research and monitoring of plant and animal species invasive species' distribution.	Researches on Invasive plant species (The Institute of Botany of the National Academy of Sciences of Armenia).

Economical and technical measures	Ex-situ conservation of rare plant and animal species.	• A gene bank of seeds (The Institute of Botany of the National Academy of Sciences of Armenia) • A gene bank of crops and their wild relatives (Agriculture and Plant Protection Research Centre of RA) • Cultivation lands of rare flora species of Armenia (a botanical garden of the NAS institutions of RA).

BULGARIA / BULGARIE

Implementation of Recommendation No. 159 (2012) of the Standing Committee, adopted on 30 November 2012, on the effective implementation of guidance for Parties on biodiversity and climate change, for the period 2012-2014

With regard to the implementation of Recommendation No. 159 (2012) of the Standing Committee, adopted on 30 November 2012, on the effective implementation of guidance for Parties on biodiversity and climate change, for the period 2012-2014, Bulgaria is providing the following information:

Climate change is one of the biggest environment challenges in recent decades. In Bulgaria, as in other countries in the region, can be observed impacts of climate change, regarding various aspects of biodiversity, presented in detail in the previous country report for the Group of Experts on Biodiversity and Climate Change to the Bern Convention.

1. Strategies and national adaptation policies

National strategy for climate change adaptation in Bulgaria is under preparation. Ministry of Environment and Water is the coordinating body of the process. While there still is no common framework for adaptation to climate change, at the sectoral level, has been taken some adaptation measures. Adaptation to climate change is included in the strategies and policies of the Ministry of Agriculture and Food, the Ministry of Regional Development, Ministry of Economy, Energy and Tourism and the Ministry of Environment and Water. Measures that directly or indirectly aimed at tackling climate change are set out in the management plans of river basin management and national parks. Their implementation is coordinated and controlled by the regional authorities of the Ministry of Environment and Water.

The strategy will cover the period up to 2030. Its goal is to reduce the vulnerability of the country to climate change and improve the capacity to adapt of the natural, social and economic systems to the adverse effects of climate change. It is envisaged to be included package of documents, being developed jointly by various institutions.

At the first stage of the preparation was developed framework document **Analysis and assessment of risk and vulnerability of Bulgarian economy sectors to climate change**, including a risk assessment of the most tipical for our geographical area natural disasters, based on weather patterns and scenarios for Bulgaria. It comprises the sectors: agriculture, water, urban environment, energy, transport, construction and infrastructure, ecosystems and biodiversity, human health and tourism, with attention to cross-border cooperation issues, regarding impact of climate change. Preparation procedure of the analysis completed in early June 2014 and available at: http://www.moew.government.bg/?show=top&cid=570.

The paper includes analysis and assessment of risk and vulnerability of the ecosystem and biodiversity. The results of the analysis show that the most sensitive to climate change are ecosystems of inland wetlands and shrub ecosystems. Furthermore, they are limited in size, which makes them particularly vulnerable. With the lowest level of sensitivity and thus the least vulnerable ecosystems are the urban areas and those with sparse vegetation and without vegetation.

The second stage of the development of National adaptation strategy has built on data, collected in the framework document. By formulating of economic analysis and specific measures should be presented strategic actions to reduce the vulnerability of our country to climate change effects.

Overall adaptation strategy will be a package of documents, including analysis on Financial Disaster Risk Management and Insurance Options for Climate ChangeAdaptation in Bulgaria. Its aim

is to identify possible and less applied mechanisms to prevent climate change risks and measures for adaptation with the participation of private business.

In the present draft of the Environment Operational Programme 2014-2020, is foreseen a separate priority Axis 4: Prevention and management of flood risks, directly related to the policy of adaptation to climate change. Measures, envisaged under priority Axis 4 aims to ensure resilience to disasters, prevention of risks to human health and the environment, and limiting the consequences of the floods. Implementation of some measures of Axis 3: Natura 2000 and Biodiversity will also contribute to adaptation to climate change. Other economic sectors relevant to climate change adaptation are also providing EU funds through corresponing operational programmes.

Bulgaria's Third National Action Plan on Climate Change 2013–2020 outlines specific mitigation measures aimed at reducing GHG emissions in all sectors. The overall impact of the proposed measures is expected to ensure the achievement of EU-set objectives that are legally binding for the country: http://www.moew.government.bg/?show=top&cid=570.

The Fifth National Communication on Climate Change to the UNFCCC and the Second National Action Plan on Climate Change identified agriculture, forestry, and land as the sectors of the highest priority for adaptation. Bulgaria has elaborated several national and sectoral mid-term and long-term programming documents, envisaging measures and activities for the adaptation of specific sectors (for example, water, agriculture, and forestry) to climate change, including the following:

- National Strategy for Water Sector Development and Management in Bulgaria for the period until 2015;
- Flood risk management program;
- River Basin Management Plans for each of all 4 Basin Directorates for Water management – East Aegean Region, West Aegean Region, Danube Region and Black Sea Region. They have been undertaking measures to tackle climate change as defined in their respective management plans, along with measures 2010-2015;
- Strategy for the Protection of Forests Against Fire;
- National Strategy for Sustainable Development of Forestry in Bulgaria for the period 2006–2015;
- National Strategy for the development of Forestry Sector 2013-2020;
- Program of measures for adaptation and mitigation of the negative climate change related effects on forests.

The presence of a number of sectoral documents, relating to climate change adaptation, suggests future development of a reliable and workable coordination mehanizan. It should allow achieving of efficiency and complementarity, in order to meet national and international targets on climate change.

The Bulgarian Parliament recently approved the Climate Change Mitigation Act. This act isintended to serve as an overall legal framework governing the government's mitigation and adaptation policies, as well as outline the institutional arrangements, roles, and responsibilities for their implementation.

2. Implementation of measures and activities set out in the Third National Action Plan on Climate Change for the period 2013-2020 in terms of biological diversity, Land Use, Land Use Change and Forestry Sector, Priority 1: Increasing the uptake of greenhouse gases.

- LIFE08 NAT / BG / 000281 ***Protection and restoration of 11 Natura 2000 habitats - riparian and wetland forest areas in 10 areas of Community importance for Bulgaria***; implementation period 2010-2014. The project aimed at improving the status of 10 zones of European significance, which are under the authority of the State Forestry Agency through conservation and restoration of riparian and wetland habitats in the forest areas. The main activities are aimed at restoring and protecting 21,000 ha riparian forests and 13 plant species; invasive alien species limitation; anthropogenic impacts limitation; application of intensive afforestation practices; raising public awareness and culture on Natura 2000 forest areas conservation;

- LIFE09NAT / BG / 000229 ***Preservation and restoration of the Black Sea Oak Habitats***; implementation period 2011-2014 The project will provide long-term conservation of priority Black Sea oak habitats through afforestation and sustainable management. Restoration measures are set for covering of an area of 230 ha, reducing the adverse effects of human activities and the risk of forest fires;
- LIFE10 NAT / BG / 000146 ***Preserving the gene pool and restoration of priority forest habitats in protected areas Natura 2000***; implementation period 2011-2015. The aim of the project is to preserve the gene pool and improve the conservation status of two priority forest habitats in protected Natura 2000 areas in Dragoman and Plana in Western Bulgaria (Pannonic forests with *Quercus pubescens* and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*). The main project activities are providing for: surveying and mapping damaged by natural disasters (fires, calamities, wind) forest habitats; analysis and assessment of the risk of future damage related to natural disasters and the effects of climate change; pilot restoration of destroyed forest habitats;
- LIFE11 NAT / BG / 000362 ***Urgent measures to restore and secure the long-term conservation of the coastal lagoon Atanasovsko ezero***; implementation period 2012-2018. The main objective of the project is to create a functional, efficient and sustainable in frastructure for water management and control of the coastal lagoon in the lake, reducing the impact of direct and indirect threats, incl. climate change on species and habitats;
- Project 58301-36-456 ***Restoration, conservation and sustainable management of biodiversity in Zlato pole Protected Site***; funded by the OPE; implementation period: 2010-2012. The project includes activities for restoration and conservation of the typical for protected site floodplain forests and hydrophilic plant communities; conservation activities on priority species – water birds, reptiles, plants, activities to combat invasive alien species; partnerships and increasing public support;
- Project 58301-46-466 ***Restoration and conservation of the Lozenski pat Protected Site - wetland, locality of summer snowflake population, and sustainable use of biological resources***, funded by the OPE; implementation period 2010-2012; The project includes restoration of the water regime of the wetland, of habitats conditions and sustainable management of the resources of the target species *Leucojum aestivum*;
- Project 58301-19-439 ***Limiting the negative impact of invasive species and restoration of natural habitats by native species planting in Srebarna Managed Reserve***, funded by the OPE; implementation period 2011-2013; The aim of the project is the conservation of biodiversity in Srebarna Managed Reserve, a UNESCO site, restoration and maintenance of habitats subject to protection. Activities include planting of native species; combating invasive species; monitoring; restoration and maintenance of technical equipment for deliquescence.

October 2014

CZECH REPUBLIC / RÉPUBLIQUE TCHÈQUE

RECOMMENDATION NO. 159 (2012) OF THE STANDING COMMITTEE, ADOPTED ON 30 NOVEMBER 2012, ON THE EFFECTIVE IMPLEMENTATION OF GUIDANCE FOR PARTIES ON BIODIVERSITY AND CLIMATE CHANGE IN THE CZECH REPUBLIC

In the Czech Republic biodiversity conservation, nature and landscape protection is sufficiently legislatively enshrined both as a special protection (species, areas) as well as general protection concerning landscape elements, species and the Territorial System of Ecological Stability of the Landscape (TSES, a national multi-level ecological network), *etc*. With regard to the climate change scenarios the Ministry of the Environment of the Czech Republic has prepared a draft of the **National Adaptation Strategy** (**Strategy of Adaptation to Climate Changes in the Czech Republic**). The strategy analyzes and proposes appropriate adaptation measures of which a substantial proportion is ecosystem- or nature-based and which are focused on 10 most threatened sectors (it includes, *inter alia*, chapter Biodiversity and ecosystem services, agriculture, forestry and water management).

The document has been elaborated by the respective ministries and recently the Strategic Environmental Assessment of the Policy has been under preparation. It is expected that the official statement from this procedure will be released approximately in June 2015, afterwards it will be submitted to the Government of the Czech Republic for adoption. The Strategy is not limited to a simple description of the possible impacts of current and expected climate change on the landscape as a whole and on its individual components, but also proposes a range of the specific measures on how to cope with the consequences of changing climate for nature and the landscape in a reasonable manner in the Czech Republic. The document summarizes the current and projected climate change effects on four main ecosystem types, namely: forest, aquatic, agricultural and urban. It also analyses financial sources, both domestic and the European Union´s funds, with proposals for their changes to enabling implementation of adaptation measures in the landscape by various stakeholders. The Strategy also includes a gap analysis of the current legislation according to various sectors. Within the Strategy measures concerning public and stakeholders awareness will be implemented as well.

The updated **State Nature Conservation and Landscape Protection Programme of the Czech Republic** was approved by the Government of the Czech Republic in November 2009. Under Chapter Landscape there is formulated a target concerning biodiversity and climate changes - to preserve and improve ecological stability (e.g., resistance and resilience) of the landscape by maintaining a network of biologically and ecologically significant elements, through a mosaic of connected biologically functioning elements (habitat patches) which are able – to some extent - to resist external negative effects including climate change. One of the key actions is up-dating of the **TSES**documentation. This network provides preservation of natural heritage including its richness, diversity and heterogeneity, favourable impact on the surrounding less healthy parts of the landscape, and forming a basis for multiple use of the landscape.

Within the financial instruments the biodiversity conservation if reflected mainly by environmental and agricultural sectors (recent and forthcoming programming period of European Union Funds, national funding programs). Partial support of biodiversity is also prepared in connection with proposal of new development plans (*e.g.*, Operational Programme Transportation). Closer involvement of other sectors into the adaptation measures on the basis of ecosystem approaches is included in the Draft National Adaptation Strategy. One of the most significant tools to support the adaptation on climate change with regard to the biodiversity is the Operational Programme Environment. By the end of the programming period 2020 many nature and ecosystem-based measures will have been implemented on the basis of the Programme in order to support biodiversity and increase in landscape water retention capacity and thereby contributing to the adaptation on climate change: ca 220 km of revitalized water flows, ca 480 ha of restored or created wetland habitats, ca 11,000 ha water surface of restored or created water basins, ca 48 km of linear erosion

control measures, ca 2,500 of new or restored landscape elements/ TSES elements, 95 wild fauna passages , increase by 160,000 ha of proportion of deciduous trees and fir and 25,000 other specific measures supporting biodiversity.

The potential increased risk of wildfires is taken into account in the National Adaptation Strategy, in Strategy of Environmental Security 2012-2015 with a view to 2020 (approved by the National Security Council in June 2012) and in prepared Strategy of Environmental Security 2015-2020 with a view to 2030 (in progress).

Prepared by: Dr. Jakub Horecký and Alena Kubánková, Ministry of the Enviroment

ITALY / ITALIE

PROGRESS IN THE IMPLEMENTATION OF THE MEASURES IDENTIFIED IN RECOMMENDATION NO. 159 (2012) ON THE EFFECTIVE IMPLEMENTATION OF GUIDANCE FOR PARTIES ON BIODIVERSITY AND CLIMATE CHANGE

Governmental Report prepared by the Italian Ministry for the Environment, Land and Sea and ISPRA (High Institute for Environmental Protection and Research)

Biological systems, including those related to agriculture, forestry and fisheries, have an intrinsic resilience and ability to adapt to changes of the environmental conditions, included the climatic changes. However, their frequency and intensity are challenging the biological systems' ability to adapt. In this context, it is necessary to apply a strategy to support their resilience.

In Italy, there are many cases that demonstrate how the **ecosystem-based measures of adaptation**, aimed at strengthening the ecosystems' resilience and to the recovery of degraded areas, thus oriented to the biodiversity protection, are more effective and economically more affordable compared to the measures based on the so-called 'hard structures' (conventional engineering systems such as dams, etc.).

The ecosystem-based adaptation measures, which recently attract a great attention, concern the adaptation interventions to defend the coastal areas, the freshwater's natural systems, agricultural systems, forests and forestry, and the management of urban green areas.

With regards to Recommendation No. 159 (2012), in order to implement effective measures on biodiversity and climate change, in the last years on the Italian territory the following initiatives were developed. It is about some national and cross-border projects that have involved several Italian contexts on the topic of the mitigation and of the climatic changes' adaptation, based on interventions in the agricultural-forestry sector, nature's protection, recovery of degraded areas and strengthening of the urban resilience.

1. Project AGROSCENARI – Scenarios of the Italian agriculture adaptations to the climatic changes

www.agroscenari.it

Research project financed by the Ministry of Agricultural, Food and Forestry Policies, as per Ministerial Decree no. 8608/7303/08 of 07/08/2008.

The Agroscenari project aims to arrange cognitive and decisional instruments. Through the integrated analysis of some Italian agricultural areas projected in future potential scenarios of Climatic Change (CC), such instruments allow to orient the agricultural activities towards CC adaptation and/or mitigation solutions according to environmental and economic sustainability criteria, moreover considering the growing economical value of water resources.

The project aims to:

- analyze and quantify the increase of the weather-climatic risk connected to the biotic and abiotic factors of the agricultural areas;
- acquire the knowledge connected to agricultural sustainable practices in order to adequately manage the available resources on the territory;
- analyze the economic sustainability of the agricultural practices applied, in order to minimize the loss and to protect the quality and quantity of the harvests;
- study the feeding systems of bovine races for milk, and pork, based on farming which optimize the water resources' use;

- search the best communication strategies to publicize the knowledge and the results obtained, in order to support, in the agricultural sector, aware and responsible behaviors at all levels of the production chain;
- define informative contents and guidelines both for political decision makers and for the agricultural operators.

Agroscenari considers two temporal adaptation scenarios: one in the short term (5 years), the other in the long term (30 years). Regarding the adaptation in the short term, it defines strategies of limitation and reduction of the impacts through a multidisciplinary approach that considers the interrelations among factors such as climate, cultivations, parasitizes, society and economic profitability of the agricultural activity considered. Regarding the adaptation in the long term, Agroscenari aims to propose the production of scenarios of climatic changes and of evolution of the productive systems, both to the national and local level.

The overall results expected from the project foresee: the definition of methodologies and operating plans, the realization of products, such as manuals, cartographies, typological maps, material for training courses with the local authorities, forecast models of the evolution of the main biotic and abiotic factors that characterize the agricultural areas, specific documents for the operating purposes of stakeholders or for the agricultural-environmental politics decision makers, but also forecast instruments for the soils' use by farms.

2. Project CLIMATE CHANGER

Climate ChangER is another example of adaptation strategy related to agriculture, regarding the protection of the agro-industrial patrimony. This project proposes the definition of breeding and cultivation techniques which, staying the quality of the products and productive yields, minimize the production of CO2 and other gases that could alter the climate. The Emilia Romagna Region participates to the project *Climate ChangER*, which is based on a partnership including important national and international groups of the agro-industrial sectors and of large distribution. The project aim is to set up new regulations of agricultural and zoo-technical production, by using the most advanced techniques identified by the international research and the know-how obtained in Emilia-Romagna in the field of the integrated approach and of the development of good agricultural and pastoral practices, such as: the reduction of the use of fertilizers and phytopharmaceutics, a more balanced management of the water resources, more sustainable techniques for hoeing the ground, different modalities of dejections' management, new types of animals' feeding.

The project foresees the in-house experimental use by a selected number of factory farms that have already given their availability, useful to the predisposition of new regulations in the regional productive chains, using also resources of the new Programme of rural development 2014-2020.

The objective of the implementation of new methodologies is to reduce the emissions of agricultural origin in Emilia-Romagna Region, of 200 thousand tons of CO2 equal in three years, consistently with the European objectives of the Strategy Europe 2020.

The project will use the *Life Cycle Assessment* approach in order to estimate the carbon footprint of the various cultivations.

3. Project STRADA

The project arose in the context of the transnational cooperation programme Italy Switzerland 2007-2013. It concerns the strategies of adaptation to the climatic changes for the management of the natural risks on the cross-border territory and it is concentrated on two main topics: the planning and the management of the water resources and the management of the hydrogeological instability, in a context of climatic change. With the objective to create compatible and shared policies on the management of the natural risks, the project *Strada* (meaning Road) intends to create a common knowledge base which could guarantee an equal cross-border informative level, prerequisite for the implementation of projects, pilot actions and activities.

Each action of the project foresees:

- the creation of common databases;

- the combined application of methodologies;
- sharing of experiences of technicians and experts of the several relevant fields;
- common validation of the final results.

Concerning the topic "water resources", this project analyzes the integrated and participated management of the freshwaters of the lakes Verbano and Ceresio, and the management of mountain springs. With regard to the hydrogeological instability topic, the analysis concerned the small-average avalanches and the characterization of the extreme precipitations in cross-border ranges. All that was treated with a coordination of the actions at the level of transnational catchment, as indicated by the Directives 2007/60/CE (evaluation and management of the flood risks) and 2000/60/CE (management of water resources).

4. Project CIRCE

This project (2007-2011), intended to develop an evaluation of the impacts of the climatic changes in the Mediterranean area, starting from the necessity to understand and to explain how the climate will change in that area, how the radioactive properties of the atmosphere could change, the interaction between cloudiness and aerosol, the changes in the water cycle.

The project assessed the variability of the extreme events and their impact, within the end of the current century, and analyzed, in a common picture, a series of quantitative indicators purposely developed for the Mediterranean environment, in collaboration with the regional actors. The results, together with the identification of the possible strategies of adaptation and mitigation, were inserted in a decisions' support system instrument and were distributed to the affected users.

The aims of *Circe* were:

- to preview and to quantify the physical impacts of the climatic changes in the area of the Mediterranean;
- to estimate the consequences of the climatic changes for the society and the economy of the populations situated in the Mediterranean basin;
- to develop an integrated approach in order to understand the combined effects of the climatic change;
- to characterize strategies of adaptation and mitigation, in collaboration with the regional actors.

The results from the *Circe* project are the outcome of the interaction of several specialized investigations merged in an integrated inter-disciplinary approach, planned in order to study the total effect of the climatic changes and to bring a contribution to the definition and evaluation of the adaptation strategies.

The Italian study cases which are included in the *Rural* section of the project are areas characterized by problems that make them particularly vulnerable to the climatic changes, such as Tuscany and Apulia Regions.

5 Project ACT (Adapting to Climate change in Time)

www.actlife.eu

The project was initiated with the priority objective to develop, through a methodological process well defined, integrated, participatory and shared by all the local actors of the territory, a Local Adaptation Strategy that takes into account the environmental, social and economic impacts of the climate change, in order to increase the cities' resilience to the change.

Every situation has its own peculiarities, and the regions of the Mediterranean basin - one of the most vulnerable zones to the effects of climate changes - have similar problems, and it has been possible to identify a methodology and a common path to make it replicable in different contexts. The methodology has been applied by the three local partners of the project - the Municipality of Ancona (Italy), the Municipality of Bullas (Spain) and the Municipality of Patrasso (Greece) - with the

technical support of ISPRA - Institute for the Environmental Protection and Research (Italy) and in collaboration with the Forum of the Adriatic and Ionian Cities (FAIC).

The application of the methodology has allowed the three partner towns to implement their own Local Adaptation Plan, aimed to limit the impacts of climate change and to reduce the vulnerability of these regions and local communities. Every plan has been designed with a priority objective: to reduce the risk of climate change by increasing the resilience of each communities. There is a close indirect relationship between the two concepts; this relation tends to reverse depending whether working on the management of impacts or on the reduction of vulnerability, i.e. if working for contingency or prevention. Moving on the ground of contingency, the impacts that the climatic event produces will be significant, thus increasing the gap between the risk level and the ability of the system to absorb it, or rather to be resilient.

6 LIFE Project TIB - Trans Insubria Bionet - Connecting and improvement of habitats along the ecological corridor Insubric Alps - Ticino Valley

www.lifetib.it

The project, which will close in December 2015, is coordinated by the Province of Varese, with the collaboration of the Lombardy Region, Lipu-Birdlife Italy and Fondazione Cariplo. Also supporting the project: 35 Municipalities, 2 Regional Parks in Lombardy (Ticino and Campo dei Fiori), 2 professional associations in the Province of Varese (Architects and Engineers' Boards), BirdLife Europe and the European Foundation Centre.

This project aims to maintain the only possible connection, for many organisms, between the Alps and the Apennines: the corridor foreseen by the RER (Regional Ecological Network of the Region of Lombardy) in the Park of Campo dei Fiori situated in the Prealps of Varese and the River Ticino. Given the presence of a wide highly urbanised area that extends from the Varesotto to Brianza areas, until Bergamo and Brescia towns, it became necessary to provide the interventions of defragmentation of the ecological corridor, in correspondence of real passages or bottlenecks.

The main objectives of the project are:

- to oppose the loss of biodiversity caused by the fragmentation of the territory, as from the degradation and destruction of habitats, through the improvement of the functionality of the ecological corridor;
- to restore the "north-south connectivity" between the alpine and continental bioregions for target species with different mobility;
- to increase the functionality of the critical passages identified along the corridor;
- to improve, where appropriate, the conservation state of the Natura2000 sites and of other protected areas or worthy of protection;
- to integrate the needs of the overall territorial planning with the demands of biodiversity safeguard and the coherence of the Natura2000 network, by strengthening the ecological goals in the territorial planning at the municipal, provincial and regional levels;
- to combat the spread of invasive alien species through strategic interventions of environmental improvement;
- to raise the institutional awareness through the dissemination of results, about the urgent necessity of regular interventions in favor of the large-scale connectivity and to foster a culture of recognition of the intrinsic value of the natural capital and ecosystem services provided by it to the relevant community.

Within the framework of the project, in May 2014, the 'Network Contract' for the Ecological Network Campo di Fiori - Ticino was signed. The signatories (45 Municipalities, Province of Varese, Ticino Park, Campo dei Fiori Park, Lipu and Cariplo Foundation) recognize in the Contract a tool for the shared planning of territorial, environmental and landscape policies, designed in order to ensure the attainment of the objective of preserving the ecological corridor. The Parties undertook to adopt the contents of the Network Contract into their planning and programming instruments. That also adopts what was already established by the Provincial Council Resolution P.V. no. 141 of 16/03/2013,

i.e. that in reason of its specific objectives of protecting the Natura2000 network, the Campo dei Fiori – Ticino network falls within the scope of the impact assessment, as governed by art. 6.3 of the Habitats' Directive 92/43/EEC with reference to plans, programs and interventions to be carried out inside.

7 Project AMICA (Adaptation and Mitigation Integrated Climate protection Approach; Interreg III, 2005-2007)
www.amica-climate.net

The project involved the city of Venice and set as objective the identification of measures that could be taken at the local level to cope the climatic changes, by combining the approaches of mitigation and adaptation.

8 Project Urban Heat Island Project –UHI (2008-2011)
www.urbanheatisland.info

Oriented to settlement contexts and financed by the ESA, the project aimed at the integration of satellite data and ground weather stations' data for prevention and reduction of risks associated with heat waves; in Italy the monitoring covered the city of Bari, with involvement of the local section of the Civil Protection.

9 Project GRaBS (Green and Blue Space Adaptation for Urban Areas and Eco Towns)
www.grabs-eu.org

This project (Interreg IVC, 2007 - in progress) aims to sensitize the administrations regarding the opportunity to increase the natural or semi-natural nets inside the city, to develop good practices that associate the increase of the urban natural characterization towards the strategies of adaptation, to elaborate *risk and vulnerability assessment tools* of easy use for the definition of adaptation strategies, to promote the involvement of citizens and decision makers. The Italian partners are the Province of Genoa, the University of Catania and Etnambiente, who recently prepared (by using the tools developed: ADAPTO- Adaptation Action Planning Toolkit) their plans of local adaptation.

10 Project GAIA (Green Areas Inner-city Agreement)
www.lifegaia.eu

The project (LIFE 2011 - ongoing) was sponsored by the city of Bologna, with Cittalia - ANCI Research Foundation, Ethic Footprint, CNR Institute of Biometeorology, and Unindustria. Its goal is to increase the endowment of green areas as contrast tools to the climate change and as emissions' compensation instrument.

The positive results achieved by the above projects show that the ecosystem-based adaptation measures, if correctly integrated into the territorial management policies and planning, help to increase the ecosystems' resilience and to stop at the same time the loss of biodiversity and their degradation. All this in agreement with the Europe 2020 strategy, that foresees the maintenance and restoring of ecosystem services through actions to reduce the habitat fragmentation and to maintain or restore the Green Infrastructures.

BIBLIOGRAPHY

Ciccarese L., Mandrone S., Pellegrino P., Vicini C., 2014. *Adattamento ai cambiamenti climatici: il ruolo trascurato degli ecosistemi*. In: Energia, Ambiente e Innovazione. N° 2-3/2014. http://www.enea.it/it/produzione-scientifica/pdf-eai/n2-2014/eai-2-3-2014.pdf

European Environment Agency, 2012. *Climate change, impacts and vulnerability in Europe 2012*. EEA Report 12/2012. Office for Official Publications of the European Union, Luxembourg. http://www.eea.europa.eu/publications/climate-impacts-and-vulnerability-2012

Filpa A. e Santolini R., 2013. *Aree urbane e infrastrutture verdi: soluzioni per migliorare la qualità dell'ambiente urbano e per mitigare gli impatti dei cambiamenti climatici.* In: RETICULA N° 4/2013. ISPRA.

http://www.isprambiente.gov.it/it/pubblicazioni/periodici-tecnici/reticula/reticula-n.-4-2013-numero-monografico

Celada C. e Soldarini M., 2013. C*ambiamenti climatici e conservazione della biodiversità: l'importanza delle reti ecologiche.* In: RETICULA N° 4/2013. ISPRA. http://www.isprambiente.gov.it/it/pubblicazioni/periodici-tecnici/reticula/reticula-n.-4-2013-numero-monografico

WEB SITES

www.actlife.eu
www.agroscenari.it
www.amica-climate.net
www.grabs-eu.org
www.lifegaia.eu
www.lifetib.it
www.urbanheatisland.info

MOLDOVA / MOLDOVA

REPORT OF THE REPUBLIC OF MOLDOVA
ON THE SITUATION REGARDING THE IMPLEMENTATION OF THE PROVISIONS INCLUDED IN

RECOMMENDATION NO. 159 (2012) OF THE STANDING COMMITTEE, ADOPTED ON 30 NOVEMBER 2012, ON THE EFFECTIVE IMPLEMENTATION OF GUIDANCE FOR PARTIES ON BIODIVERSITY AND CLIMATE CHANGE

1. Urgently implement the practical conservation measures that have been recommended by the Group of Experts and encourage appropriate national bodies involved in nature conservation to adopt and use them as resources permit; urgent action should more particularly focus on implementing adaptive management practices and strategies, enhancing the adaptive capacity of vulnerable species (rare/endemic/threatened), minimising pressures and threats on species and habitats that are most vulnerable to climate change, and implementing monitoring of, *inter alia;* species' population trends, species behaviour, including phenology, and climate change impacts upon critical areas;	The Ministry of Environment has proposed to the Institute of Ecology and Geography of the Academy of Sciences of Moldova to introduce in their working plan the items on researching of vulnerable species (rare/endemic/threatened) in the view of identification of solutions for minimizing the pressures and threats on species and habitats that are most vulnerable to climate change. The proposed items are included in the project: Study on the impact of natural and anthropogenic factors and geo-ecosystems in the Republic of Moldova in order to improve the management of natural resources and conservation of representative areas. The project has 5 stages till 2016. Within the Institute of Ecology and Geography there is the Laboratory of Climatology. The main researches are focused on followings: -comprehensive assessment of climate component of landscapes; - regional climate change as a consequence of the global climate change; - impact of climate change on agricultural crop growth and development, as the Republic of Moldova is an agrarian country. The Ministry of Environment of the Republic of Moldova has proposed to the Institute of Zoology of the Academy of Sciences of Moldova as research subject "Climate change impacts on migratory species", the long term research item. The migratory species are most significantly threatened by climate change. <u>Publication</u> Corobov R., I. Trombitsky, G. Sirodoev, A. Andreev. Climate change vulnerability: Moldavian part of the Dniester River basin, 2014(in Russian) This collective monograph summarizes one of the first experiences grated in the integrated assessment of a river basin vulnerability to climate change. The object of study – the right bank of the Dniester River in the Republic of Moldova – is interesting as a part of the basin of a large transboundary river, shared by this country and Ukraine; thus, its resilience to climate threats is largely determined by the current state of socio-ecological systems of both countries. The assessment was based on the modern concept of vulnerability to climate change as a function of exposure to its impacts, sensitivity to these impacts and a potential to mitigate their negative consequences. In each of these components, along with the purely hysical and geographical aspects, there were considered social, economic, environmental and other characteristics change, its impacts on water resources and related socio-ecological systems.

2. Take further steps to develop ecological networks, to promote and enhance the permeability of landscapes generally, and also enhance their protected areas networks, as appropriate, by increasing the extent of existing sites, designating new sites and establishing buffer zones, and ensuring they are sustainably and adaptively managed;	The legal basis for creation of the National Ecological Network (NEN) of Moldova was formulated in 2007 when the Law on Ecological Network and the Programme on establishment of National Ecological Network for 2011-2018 were approved. Among other, the National Programme supposes development of land use plans and zoning of areas that are integrated in the NEN. The two important documents in general reflect the "Concept of Ecological Network of the Republic of Moldova" (2001), elaborated by BIOTICA Ecological Society, which incorporated national experience and findings of documents related to the Pan-European Biological and Landscape Strategy, such as "Development of an Approach to a Pan-European Ecological Network: concept and criteria" (1988) and "Guidelines for the Development of the Pan-European Ecological Network" (1999). Core Area of ecological network can be conceived as Protected Area (PA) in the common use of this term. However, on one hand a Core Area might be under common economical use and on the other hand, high biodiversity value could sometimes be determined by the economic use (e.g. waterfowl concentrations in managed water bodies). Core Area often comprises PA and adjacent territory under the economic use, given that the ecosystem approach defines its borders. Core Area might also be a part of large PA with diverse tenures and uses e.g. in Ramsar Site. Currently the Ecological Society "BIOTICA" within the project "Formation of National Ecological Network - contribution to local and national level" funded by the GEF Small Grants Programme was elaborated the Guidance on the assessment of the ecological network core areas. The Guidance include a clear procedure of dividing the core areas of importance in the international, national and local mainly based on numerical criteria and required for finishing designation REN core areas. This document basically completes the set of documents required for the formation and functioning of the National Ecological Network. The Ministry of Environment will approve the Guidance <u>Publications</u> The bi-language (in Romanian and Russian) edition ***„Ecological Network. Challenges. Solutions"*** provides with brief information about crucial environmental problems and importance of creation of ecological network for solving, including the adaptation to climate change. Also an economical substantiation for ecological network creation is provided with some evaluations of ecosystem services and economical losses provoked due to ecological unbalance of the territory. The brochure is prepared in frame of the project «Development of the National Ecological Network of Moldova as part of the Pan-European Ecological Network with the emphasis on trans-boundary cooperation» supported by the Norwegian Government and implemented by the BIOTICA Ecological Society and IUCN SEE Program Office in coordination with the Ministry of Environment of the Republic of Moldova.
3. Take an appropriately long-term view, based on adaptive management methodologies, when formulating management	Recently, by the Government (Decision No 301 from 24.04.2014) has been approved the Environmental Strategy and Action Plan for the period 2014-2023. In this document is stipulated appropriately long-term view, based on adaptive management methodologies and actions of

plans and strategies for protected areas management;	conservation of environment factors. Also, the appropriately long-term view on biological diversity conservation is stipulated in the National Strategy of Biodiversity Conservation and Action Plan till 2020. By the Government on 24 october 2014) has been approved the National Climate Change and Adaptation Strategy of the Republic of Moldova, which includes: -Impacts by Sector -Climate Change Impacts on Agriculture -Climate Change Impacts on Water Resources -Climate Change Impacts on Health -Climate Change Impacts on Forests: *-possible impact of climate change on forest resources* *- assessing the magnitude of risk/opportunities of climate change on forest resources* *- priority risks and opportunities for the forest sector* *- examples of adaptation measures in forestry sector to climate change.*
4. Adopt, as appropriate, a more holistic approach when formulating strategies and plans for ecological networks or protected areas, and when developing conservation or recovery plans for individual species. In particular, encourage the general adoption of the examples of good practice reported, especially by Switzerland and Ukraine, with respect to taking into account their international context when planning ecological networks, and to developing networks and protected areas in partnership with their neighbours;	In the Environmental Strategy and the Action Plan for the period 2014-2023, the Objective 6. Assuring of rational use of natural resources and protection of natural resources are underlined the necessity of taking urgent measures for increasing the surface of forests, to increase the surface of protected areas, to stop the soil degradation via afforestation and to prevent the natural disasters.
5. Adopt measures that encourage biodiversity conservation to be embedded across other sectors and taken into account when formulating policies or strategies for those sectors, also by informing policy-makers across the Parties about the opportunities for win–win solutions, for instance through the development and use of ecosystem-based approaches, when developing strategies for adaptation to climate change by their sector as well as for mitigation measures;	In the Environmental Strategy and the Action Plan for the period 2014-2023, the Objective 2: Integrate the principles of environmental protection, sustainable development and green economy development, adaptation to climate change in all sectors of the national economy. The main Directions of actions are the followings: 1) providing conditions for good governance and efficiency of institutional capacity and environmental management in order to achieve the environmental objectives; 2) integration of principles of environmental protection, sustainable development and green economy development, adaptation to climate change in all sectors of the national economy; 6). e) extension of forest areas till 15% and extension of state protected natural areas till 8% of the country surface; to ensure efficient and sustainable management of natural ecosystems; The integration of environmental issues and the adaptation to the climate change into economy polices and sustainable practices require to be

	implemented at national and local levels. These are very essential in the view of reducing the policy pressures from other economical sectors on environment and to achieve the adopted targets on environment and climate. Integration of the sustainable development and the climate change adaptation in the forestry sector it is targeted at: - designing the stable and diversified forests; - improving the numeric stability by selecting the species, origin and corresponding genotypes; - increasing forest cover in order to mitigate climate change and increasing biological diversity; - highlighting the areas of stability and resistance of ecosystems, their flora and fauna to climate change impacts; - establishment the forest plantations for industrial and energy needs; planting the energetic forests; - regulation the maintenance and conservation of forestry plants, forest genetic resources conservation, ecological restoration of forests; forest certification; - creating production systems and adequate forest management.
6. Undertake knowledge transfer activities using existing mechanisms, to encourage awareness by other stakeholders and the general public of the challenges posed and opportunities presented by climate change when considering biodiversity conservation, including its links to other sectors and the opportunities for win–win solutions;	In the Environmental Strategy and the Action Plan for the period 2014-2023 it is specified the objective and actions on ecological education and large public awareness.
7. Take account of the potential increased risk of wildfires as a result of climate change and embed, as appropriate, mitigation measures for consideration of this risk into protected area management plans;	The lessons to be learned from the Parties which have the good practices. Moldova has the good experiences on Clean Development Mechanism projects development in the forest field; the sequestration of CO2 via afforestation.
8. Adopt the good practice, identified in the case of the United Kingdom, of implementing measures for the assessment of introductions that include assessment of the impacts of projected climate changes on species' invasion potential.	The lessons to be learned from the Parties which have the good practices.

MONACO / MONACO

PRINCIPAUTÉ DE MONACO
DÉPARTEMENT DE L'ÉQUIPEMENT, DE L'ENVIRONNEMENT ET DE L'URBANISME

DIRECTION DE L'ENVIRONNEMENT

SOMMAIRE

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Sous l'impulsion de Son Altesse Sérénissime le Prince Albert II, le Gouvernement Princier agit en faveur d'un développement durable de la Principauté en portant ses actions sur la conservation de la biodiversité, la préservation des ressources, la réduction des émissions de gaz à effet de serre et une politique en faveur d'une ville durable.

La Principauté de Monaco est Partie aux deux grands textes internationaux en la matière : la Convention sur la Diversité biologique et la Convention sur le Changement Climatique.

La volonté politique et la vision du Gouvernement en matière de développement durable se manifeste au niveau réglementaire dans le projet de Code de l'environnement, déposé au Conseil National en décembre 2008.

L'ambition de ce texte pourrait se résumer en une phrase : « *Le droit à un environnement sain* ». Il couvre l'ensemble des volets liés à la protection de la nature et des milieux, aux pollutions, aux risques et nuisances et au renforcement de la qualité de vie. Par ailleurs un livre entier est consacré à l'énergie. Une démarche totalement novatrice dans un Code de cette nature.

La politique du Gouvernement en faveur du développement durable s'appuie sur quatre piliers :

- la gestion du patrimoine naturel et la protection de la biodiversité ;
- la mise en œuvre du Plan Energie Climat ;
- les actions en faveur d'une ville durable ;
- la mobilisation de l'état et de la communauté monégasque.

La politique menée par le Gouvernement Princier comporte des volets relatifs à la gestion du patrimoine naturel et à la prise en compte du changement climatique. Ces deux volets sont présentés ci-après en précisant qu'ils sont en interaction.

POLITIQUE DE GESTION DU PATRIMOINE NATUREL

En matière de biodiversité, le Gouvernement Princier dispose d'une politique de gestion du patrimoine naturel dont la stratégie de surveillance de la biodiversité terrestre et marine de la Principauté est fondée sur trois grands axes :

- Les inventaires,
- Les cartographies,
- Les suivis d'indicateurs biologiques.

De nombreux inventaires ont été engagés en Principauté en s'appuyant notamment sur les recommandations des différentes conventions internationales auxquelles Monaco est Partie.

Les inventaires d'espèces et d'habitats sont des outils de connaissance, de sensibilisation, mais également d'aide à la décision pour l'État dans la mise en œuvre de sa stratégie de surveillance et de protection de la biodiversité marine et terrestre et de sa politique d'aménagement du territoire.

Les inventaires représentent la base de la connaissance du milieu. Ils permettent un recensement précis des espèces et participent à la valorisation du patrimoine naturel de la Principauté. La réalisation d'inventaires réguliers rend possible le suivi dans le temps de ce patrimoine.

N'étant pas seulement une liste exhaustive d'espèces, ils permettent d'identifier les espèces utilisables en tant qu'indicateur biologique. Le recensement de ces populations et l'étude de leur dynamique rendent également compte de l'efficacité des mesures de protection ou de restauration en cohérence avec une politique de conservation des écosystèmes.

Le rôle des bio-indicateurs est de détecter les perturbations de l'environnement marin, de mesurer les effets de ces perturbations et d'apprécier les modifications des conditions environnementales. Ils constituent des outils de prédiction, d'aide à la décision et de communication et sont indispensables à l'établissement d'un diagnostic écologique.

Ces indicateurs biologiques sont basés sur l'utilisation d'espèces clés ou de modèles biologiques sensibles aux perturbations du milieu (pollutions, invasions, changement global).

Cette démarche sert de base à la gestion du milieu et peut être un outil essentiel dans l'adaptation de la réglementation.

La Direction de l'Environnement a mis en place depuis une dizaine d'années des suivis d'indicateurs biologiques portant sur des paramètres démographiques et dynamiques, et des indices de vitalité et de nécrose (gorgonaires, échinodermes..).

En matière d'aménagement du territoire, la prise en compte de l'environnement dans l'élaboration de projets urbanistiques se traduit par la réalisation d'Etudes des Incidences sur l'Environnement. Ces études visent à prévenir les impacts négatifs d'un projet sur l'environnement (naturel et anthropique) et à mettre en œuvre des mesures compensatoires.

L'Ordonnance Souveraine n° 3.647 du 9/O9/1966 concernant l'urbanisme, la construction et la voirie, modifiée, en application du Code de la Mer, rend obligatoire la réalisation d'une étude des incidences, directes et indirectes, d'un projet sur l'environnement marin.

1. Gestion de la biodiversité marine

En matière de biodiversité marine, la Principauté a instauré deux zones protégées :

- La réserve du Larvotto d'une surface de 33 hectares, créée en 1978, est principalement destinée à la conservation et à la valorisation d'un herbier de posidonies. Elle dispose d'un statut de protection renforcé. Seule est autorisée la pratique des bains de mer, et sous certaine condition les sports nautiques, la recherche scientifique et la plongée sous-marine. Toute autre activité est

interdite. Une partie de la réserve est inscrite sur la liste des zones humides au titre de la Convention RAMSAR (Convention sur les zones humides d'importance internationale).

- La réserve des Spélugues, dite « tombant à corail », créée en 1986, est principalement destinée à la protection d'habitats et d'espèces emblématiques de la Méditerranée, telles que le corail rouge, des éponges, des gorgones et des mérous. Sous certaines conditions, la navigation, la pêche professionnelle, la plongée et la recherche scientifique peuvent être autorisées. Les autres activités sont interdites.

La politique gouvernementale prévoit également la mise en place d'outils de gestion performants comme le programme d'immersion de récifs artificiels de grande ampleur le long du littoral monégasque, initié en 2010, et dont l'objectif est de permettre une valorisation biologique de certains fonds. Une partie de ces aménagements permettra également de valoriser la biodiversité qui s'y développera en proposant de nouveaux spots pour la plongée sous-marine.

1.1 Inventaires

Une attention particulière est apportée aux espèces patrimoniales ou protégées (posidonies, grandes nacres, mérou brun, corail rouge, gorgone, ...), aux habitats remarquables (Tombant coralligène, Roches St Martin, Roches St Nicolas, …) et aux aires marines protégées (Larvotto et Spélugues).

- L'exploration des Roches Saint Martin situées au large de la grande digue sur des profondeurs de 60 m, a permis d'inventorier des bouquets de grands bryozoaires, des amas d'éponges, de grandes colonies de gorgones ainsi que du corail rouge. Les peuplements des Roches Saint-Martin présentent un parfait état de vitalité, grâce, notamment, au bénéfice d'un régime d'eau froide et agitée.

- En 2006, l'inventaire ichtyologique (poissons) a permis d'identifier 224 espèces de poissons dans les eaux monégasques, réparties en 87 familles.

  Cet inventaire a été complété, en 2009, par un inventaire des mérous bruns, espèce protégée en Principauté avec 105 individus répertoriés. En comparaison, 12 individus avaient été repérés en 1998 et 83 en 2006. Cette augmentation spectaculaire de la population de mérou brun a démontré l'efficacité des mesures de protection mises en place en Principauté. La Direction de l'Environnement réalise des mises à jour de cet inventaire et un suivi de la population de mérou brun.

- En 2008 , le suivi du peuplement et la cartographie des grandes nacres (*Pinna Nobilis*) a permis de répertorier 450 individus au sein de la Réserve du Larvotto.

L'état des herbiers de posidonies, la biodiversité des peuplements de poissons, de l'endofaune benthique et de la macrofaune benthique peuvent être utilisés comme des indices écologiques de l'état du milieu marin.

1.2 Cartographies

Les cartographies des biocénoses marines permettent de recueillir de nombreuses informations quant à la répartition spatio-temporelle des espèces. Ces études permettent un positionnement précis des différents types de fonds, d'habitats ou d'espèces et donnent aussi des informations sur les aires de répartition des individus.

Elles aident à évaluer qualitativement et quantitativement l'état de santé et la richesse du monde vivant.

Dès 2002, une cartographie des biocénoses marines de la Réserve marine du Larvotto a permis de positionner la limite inférieure de l'herbier de posidonies, de cartographier les différentes biocénoses de part et d'autre de cette limite et de recenser les différents types d'habitats présents.

48 balises permanentes ont été positionnées sur toute la limite inférieure de l'herbier de posidonie, permettant ainsi d'effectuer un suivi à long terme de l'état de son état de vitalité. Cet herbier, dont l'état de vitalité est relativement stable, témoigne de la bonne qualité du milieu marin en Principauté.

En 2010, la Direction de l'Environnement a réalisé une cartographie sonar des fonds marins se situant entre 0 et 100 m de profondeur. Cette cartographie dont l'objectif était de combler le déficit de connaissance sur certaines zones du territoire a été couplée d'une bathymétrie 3D comprenant la caractérisation de la nature des fonds marins de tout le littoral monégasque.

Cette cartographie a permis de visualiser les reliefs composant ces fonds et d'identifier plusieurs zones ayant un fort potentiel écologique, notamment un important peuplement coralligène situé à l'Est de la Principauté.

1.3 Indicateurs biologiques.

Parmi les grandes nacres (*Pinna Nobilis*) répertoriées au sein de la Réserve du Larvotto, un certain nombre d'individus « sentinelles » a été marqué pour leur suivi dans le temps (croissance et mortalité) afin de pouvoir suivre l'état de santé de ce peuplement à long terme. Sensibles à la qualité de l'eau, cette espèce représente un bon indicateur de la qualité du milieu marin.

Les habitats offerts par la contre-jetée du port de la Condamine ayant révélé des cavités obscures susceptibles de constituer des milieux adaptés à l'installation d'une faune cavernicole font l'objet d'un programme de suivi à long terme de la dynamique de leur colonisation depuis 2005.

2. Gestion de la biodiversité terrestre

Dans le domaine terrestre, le Gouvernement Princier poursuit ses efforts de protection du patrimoine naturel en étudiant la création d'une première zone protégée terrestre. En effet, la falaise du Rocher représente une des zones les plus riches en terme de biodiversité justifiant de pouvoir bénéficier d'un statut de protection qui permettra la mise en place d'un programme de gestion.

Dans le cadre des programmes de coopération internationale, une Convention de partenariat entre le Gouvernement Princier, le Parc National du Mercantour, le Parc Naturel Alpi Marittime et la Fondation Prince Albert II de Monaco, a été signée en 2008. Ces deux parcs constituent un patrimoine naturel exceptionnel aujourd'hui menacé, notamment par le changement climatique.

Cette coopération a pour objectifs d'améliorer la connaissance et la compréhension de l'évolution de la biodiversité dans cet espace naturel, d'en promouvoir une gestion exemplaire, notamment en matière de tourisme durable, et de favoriser au plan international le partage d'expériences qui en résulte.

Un des projets de ce partenariat concerne la réalisation de l'un des plus ambitieux inventaires systématiques du vivant au monde, puisqu'il prévoit de couvrir l'intégralité des territoires des deux espaces naturels, soit près de 2450km^2.

Cet inventaire, initié en 2008, s'appuie notamment sur l'accueil et l'encadrement d'équipes internationales de scientifiques mais aussi des naturalistes locaux, détenteurs pour certains de connaissances très pointues.

Cette connaissance du vivant pourrait conduire notamment à la mise en place de « réservoirs de biodiversité », lieux de suivi de l'évolution libre des milieux naturels et notamment forestiers.

2.1 Inventaires

Bien que Monaco soit un Etat dont le territoire terrestre est essentiellement, voire totalement, urbanisé, le Gouvernement s'est intéressé à la biodiversité néanmoins présente sur cette portion de son espace.

Les inventaires terrestres effectués en Principauté ont révélé une richesse exceptionnelle donnant lieu à plusieurs découvertes remarquables.

L'originalité de Monaco, en tant que pays urbain permettant le maintien voire le développement de cette biodiversité terrestre semble tenir à certaines particularité spécifiques :

- La réglementation favorable à la conservation de la faune locale. La chasse est interdite sur tout le territoire depuis 1880.

- La configuration géologique et urbanistique du territoire. Les falaises du Rocher constituent de véritables refuges où peuvent se maintenir ou se développer une vie sauvage à l'abri de toute pression anthropique.
- Les « confettis verts » (jardinets, terrasses, murs végétalisés, ...).
- Les espaces verts entretenus de façon écoresponsable représentent des oasis de verdures pour la faune.

L'ensemble des inventaires réalisés depuis 2006 a permis d'identifier :

- 2006 : la flore terrestre indigène du territoire de la Principauté. Cet inventaire a mis en évidence 5 habitats d'intérêt patrimonial, 346 espèces indigènes dont 6 espèces endémiques et 18 espèces à fortes valeur patrimoniales. Parmi elles, la présence de la Nivéole de Nice (*Acis nicaeensis*), espèce rare et très menacée, endémique de la région niçoise, a été localisée sur 4 stations de la Principauté. Les falaises du Palais Princier représentent un enjeu majeur de conservation : elles abritent 4 espèces endémiques, 12 des 18 espèces patrimoniales ainsi que 3 des habitats d'intérêt patrimonial.

  Un suivi annuel est effectué portant sur l'étude de la dynamique de la végétation après purge ou arrachage des espèces exotiques envahissantes.

- 2008-2011 : l'entomofaune (insectes). L'étude a porté sur les arthropodes de la Principauté, coléoptères et hétéroptères et comporte un aperçu sur les fourmis, les isopodes et les pseudoscorpions. Cet inventaire a montré des résultats particulièrement intéressants en dénombrant 330 taxons de Coléoptères (sans compter une dizaine de taxons d'Aleocharinae, staphylins d'identification très délicate) et 101 taxons d'Hétéroptères.

  Parmi les coléoptères, 2 espèces nouvelles pour la Science ont été recensées en Principauté :

  - un Anobiidae du genre Synanobium probablement d'origine tropicale, observé sur les glacis du Palais et à la Source Marie ;
  - un Curculionidae cavernicole dénommée *Otiorhynchus (Lixorrhynchus) monoecirupis n.sp* qui est certainement le 1er insecte endémique de la Principauté puisqu'il est exclusivement lié aux galeries creusées sous le Palais Princier.

  Cet inventaire a également recensé de nombreuses espèces de coléoptères soit nouvelles pour la faune franco-monégasque, soit d'un grand intérêt patrimonial pour la Principauté puisqu'il s'agit souvent d'espèces méditerranéennes à fort enjeu de conservation. C'est le cas du charençon *Dichromacalles rolletii*, dont la présence a été montrée sur le Rocher.

  Parmi les milieux étudiés, les glacis du Palais Princier représentent le biotope le plus riche et comprenant le plus grand nombre d'espèces d'intérêt patrimonial. La protection de ce milieu unique doit être considéré comme un objectif prioritaire.

- 2010-2012 : l'avifaune. Cet inventaire ornithologique a permis de comptabiliser 60 espèces d'oiseaux dont 10 bénéficient d'une protection au niveau européen et 7 sont considérées comme menacées (vulnérables ou quasi-menacées). Les falaises du Rocher se sont révélées très favorables aux oiseaux. 2 espèces remarquables ont été recensées :

  - le Faucon pèlerin (*Falco peregrinus*), rapace diurne rupestre, espèce vulnérable : un couple nicheur et reproducteur a été observé sur la falaise du Rocher (3 jeunes en 2010) ;
  - Le cormoran huppé de Méditerranée (*Phalacrocorax aristotelis desmarestii*), espèce marine sédentaire, vulnérable : 6 individus dont 4 juvéniles ont été observés.

- 2012-2013 : l'herpétofaune. Des populations d'Hémidactyle verruqueux (*Hemidactylus turcicus*) et de La Tarente de Maurétanie (*Tarentola mauritanica*) ont été recensées.

2.2 Cartographies

Les différents inventaires sont analysés en vue d'établir les cartographies correspondantes pour la partie terrestre du territoire monégasque.

2.3 Indicateurs biologiques

Fin 2010, la Principauté a conclu une convention de partenariat avec l'Union Nationale de l'Apiculture Française (UNAF), visant la création d'un rucher à Monaco et apportant son soutien à la Charte *« Abeille, sentinelle de l'environnement »* .

Les abeilles jouent un rôle prépondérant de pollinisation pour plus de 80 % de notre environnement végétal et plus de 20 000 espèces végétales menacées sont sauvegardées grâce aux abeilles, tandis que 40 % de l'alimentation humaine (fruits, légumes, oléagineux…) dépendent de leur action. Parallèlement à ces chiffres révélateurs du rôle central de l'abeille, les apiculteurs français ont enregistré la disparition depuis 1995 de près de 30 % des colonies d'abeilles.

Six ruches ont été installées sur le toit terrasse du Musée des Timbres et des Monnaies à Fontvieille. Ce programme permet également de mener des campagnes de sensibilisation auprès des scolaires de la Principauté. Le suivi des populations d'abeille se fait en parallèle avec l'analyse de l'évolution du climat.

LUTTE CONTRE LE CHANGEMENT CLIMATIQUE

La lutte contre le changement climatique repose sur deux aspects :

- La mitigation, qui vise à limiter les effets des changements climatiques en mettant en œuvre une politique de réduction des émissions de gaz à effets de serre.
- L'adaptation qui consiste à quantifier les changements à venir et à identifier les impacts sur l'homme, les activités humaines et les écosystèmes et à mettre en œuvre les mesures d'adaptations.

La politique de mitigation a constitué la priorité d'action gouvernementale en matière d'énergie et de climat pour Monaco.

Cette politique s'est traduite par la ratification de la Convention Cadre des Nations Unies sur les Changements climatiques et la définition d'objectifs de réduction des émissions de gaz à effets de serre, la mise en œuvre du plan Energie Climat qui fixe également des objectifs de réduction pour les consommations énergétiques et l'utilisation des énergies renouvelables.

La définition d'une stratégie adaptation aux changements climatiques doit permettre d'identifier et prévenir des impacts des dérèglements climatiques sur les milieux les personnes, le cadre de vie, les intérêts sociaux et économiques de la Principauté autour d'un diagnostic de vulnérabilité et de la mise en œuvre de mesures d'adaptation.

Les travaux qui sont entrepris doivent permettre la mise en perspective de mesures, qui ont déjà cours, et qui s'inscrivent pleinement dans une stratégie d'adaptation au changement climatique, et de définir les mesures complémentaires à réaliser pour assurer, dans le contexte territorial particulier de la Principauté, cette adaptation.

La Principauté a également ratifié le Protocole de Kyoto en 2006 et intégré le réseau de neutralité carbone du Programme des Nations-Unies pour l'Environnement en 2008 (CN Net).

Dans ce contexte, le Gouvernement Princier met en oeuvre un Plan Energie Climat répondant à deux enjeux majeurs : la lutte contre le changement climatique et la sécurisation énergétique du pays.

Dans le cadre de la Convention sur les changements climatiques, la Principauté de Monaco a établi sa 6ème Communication Nationale dans laquelle le chapitre 6 est consacré aux impacts du changement climatique, à la réalisation d'un diagnostic des vulnérabilités et à l'analyse des adaptations.

Dans sa 6ème Communication Nationale sont reportées les évolutions des températures, des précipitations et du niveau des mers afin de dégager des scenarii sur l'évolution bioclimatique de Monaco conformément aux dispositions du Protocole de Kyoto. Les extraits correspondants sont

reproduits ci-après, le document intégral peut être consulté sur le site de la Convention sur le changement climatique).

En parallèle, la Principauté a mené une étude intitulée « Analyse des tendances climatiques à l'échelle de la Principauté de Monaco, conséquences sur les populations de moustiques et moyens de prévention » menée par le Docteur Camille ROUMIEUX, décembre 2013.

Cette étude a pour objectif de préciser les tendances climatiques à Monaco et d'étudier les impacts sur une population de moustique. Elle a révélé un allongement de la durée d'activités de l'espèce due au réchauffement climatique.

Elle est un préalable à une étude des impacts des changements climatiques sur la biodiversité à Monaco mais également sur la santé, le tourisme et l'économie.

ANNEXE – 6E COMMUNICATION NATIONALE DE LA PRINCIPAUTE DE MONACO A LA CONVENTION CADRE DES NATIONS UNIES SUR LES CHANGEMENTS CLIMATIQUES

Mars 2014

EXTRAITS

6 – IMPACTS, VULNERABILITE ET ADAPTATION

2.4 Impacts

2.4.1 Observation du climat

Températures

La comparaison des moyennes annuelles observées à Monaco depuis 1969 par rapport à la normale sur la période 1981-2010 montre que la majorité des années les plus chaudes sont observées après 2000, l'année la plus chaude ayant été 2006.

Les années 2011 et 2012 font partie des années les plus chaudes observées depuis 1969, respectivement 2e et 6e place. En 2011, il a été enregistré la moyenne des températures minimales la plus chaude depuis 1969 avec 14,8°C.

La tendance montre également un réchauffement progressif de l'ordre de 1,5 °C qui a été relevé depuis 1969.

FIG 6.1 : Différence des températures moyennes annuelles par rapport à la normale 1981-2010

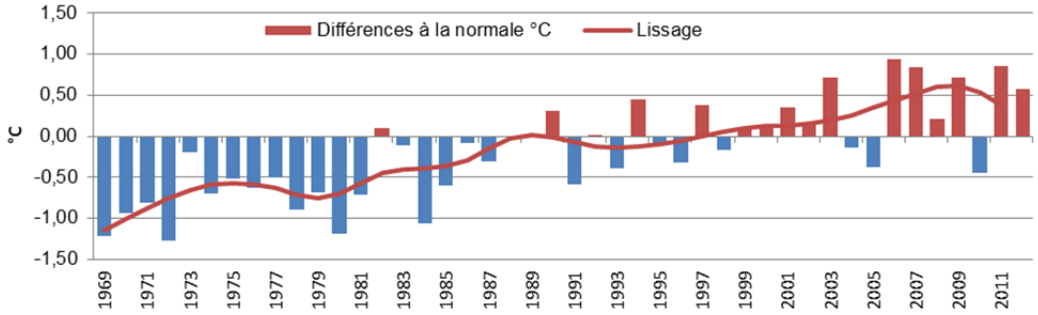
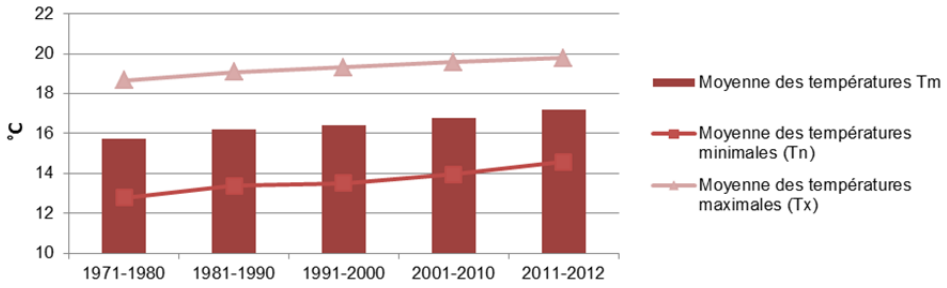


FIG 6.2 : Moyenne des températures décennales 1971-2012



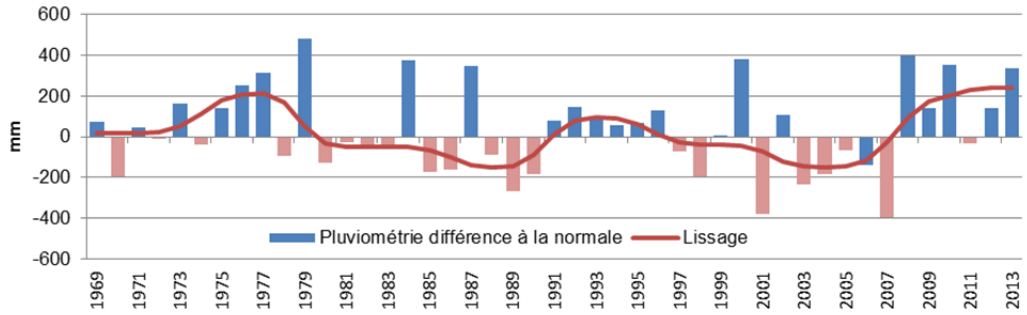
Cette tendance à l'augmentation des températures est également mise en évidence par l'analyse des moyennes des températures décennales. Cette élévation des températures est régulière et plus importante pour les températures minimales.

Précipitation

Le cumul de pluviométrie annuel sur la période normale 1981 à 2010 est de 735.4 mm. De 1990 à 2010, on a compté une moyenne de 63 jours annuels où la pluie a été supérieure à 1mm.

La moyenne annuelle des précipitations établie entre 1911 et 1985, à Monaco, est de 763 mm. Le bilan hydrique de la dernière période normale (1981-2011) est, en moyenne, déficitaire. Cependant, parmi les 6 dernières années 5 sont largement excédentaires. Ainsi, contrairement aux températures, l'identification d'une tendance n'est pas mise en évidence à partir des cumuls annuels.

FIG 6.3 : Différence des cumuls pluviométriques annuels par rapport à la normale 1981-2010

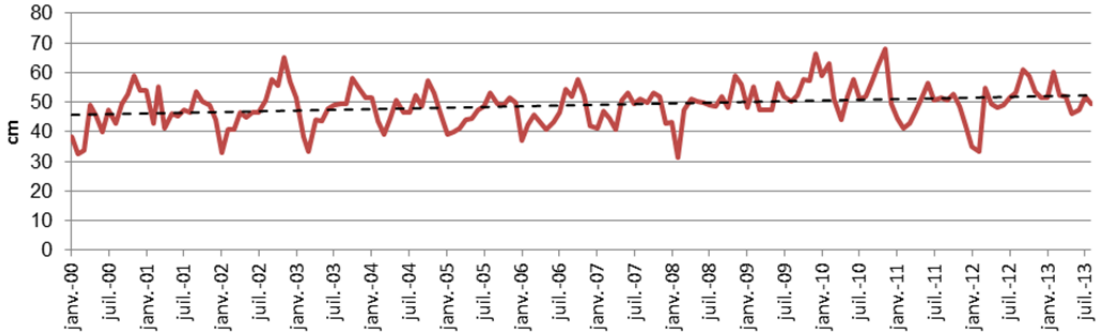


Niveau des mers

De par ses caractéristiques géographiques, l'élévation du niveau des mers constitue un des impacts les plus sensibles des effets du changement climatique à Monaco. Depuis 2000 une mesure de la hauteur des eaux marines est réalisée par un marégraphe numérique côtier opéré en collaboration avec le Service Hydrographique et Océanographique de la Marine française (SHOM).

Depuis la mise en œuvre des mesures, il a été observé une augmentation de 4.7 cm du niveau de la mer pour 10 ans.

FIG 6.4 : Variation du niveau mensuel moyen de la mer à Monaco de 2000 à 2013



2.4.2 Caractérisation des tendances climatiques actuelles et futures à l'échelle de la Principauté de Monaco

Une première étude sur l'évolution des tendances climatique a été entreprise par l'intermédiaire d'une analyse à haute résolution des différentes variables climatiques sur la Principauté de Monaco et ses alentours (Adaptation aux changements climatiques à l'échelle de la Principauté de Monaco - Dr Camille Roumieu –décembre 2013).

Cette étude vise à évaluer les tendances d'évolutions des températures et des précipitations, sur la base climatique de la période 1950-2000, suivant les scenarii officiels du GIEC A2 et B2 à l'horizon 2020, 2050 et 2080.

L'évaluation de l'évolution des tendances a été réalisée à partir de la base de données WorldClim (www.worldclim.org) pour les données « actuelles » et « futures » de température et de pluviométrie utilisées». Les valeurs de températures obtenues sont les valeurs haute résolution interpolée sur la zone de Monaco tenant également compte de l'altitude.

Les résultats obtenus ont également permis de calculer les évolutions des besoins énergétiques au travers du calcul des degrés jour unifié pour le chauffage et la climatisation selon les résultats des deux scénarii.

Cette analyse a également permis, suivant les critères établis par Emberger (1955), d'identifier les évolutions des différents sous-étages bioclimatiques et des types d'hiver sur la zone géographique de Monaco. (Roumieux, 2012).

Evolutions des températures

Les anomalies de température moyenne annuelle sont plus importantes pour le scénario A2 que pour B2 et pour les horizons les plus lointains. Les augmentations sont plus importantes pour les températures minimales mis à part en 2080 pour le scénario A2 ou l'augmentation prévue est plus importante pour les températures maximales.

Les augmentations projetées des températures moyennes sont de de 2.1°C, 3.5°C, 5.5°C pour le scénario A2, et de 2.3°C, 3.2°C, 4.0° pour le scénario B2, respectivement pour les horizons 2020, 2050, et 2080. Du point de vue de la répartition annuelle, les anomalies de température les plus importantes se retrouvent en hiver (janvier février) et en été (juillet et août) pour chacun des deux scénarii, le scénario A2 présentant les différences les plus importantes par rapport à la situation actuelle.

FIG 6.5 : Evolution des températures suivant les scénarios climatique A2 et B2

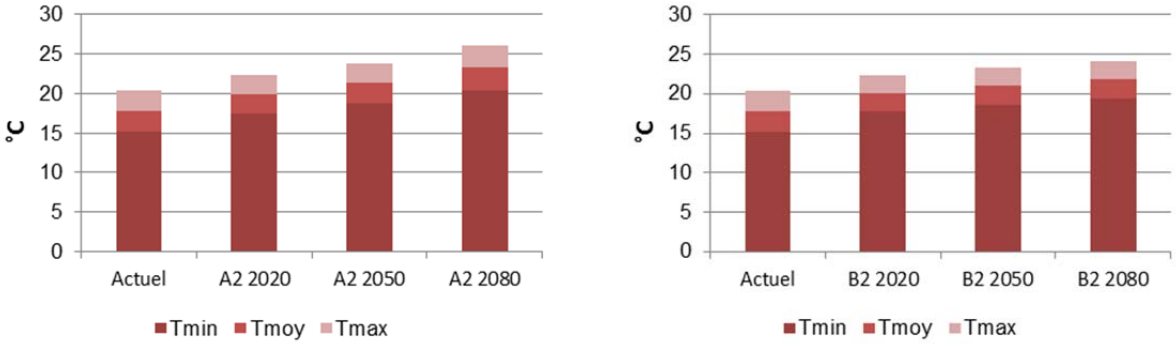


FIG 6.6 Différences de températures suivant les scénarios climatique A2 et B2 par rapport à la température actuelle

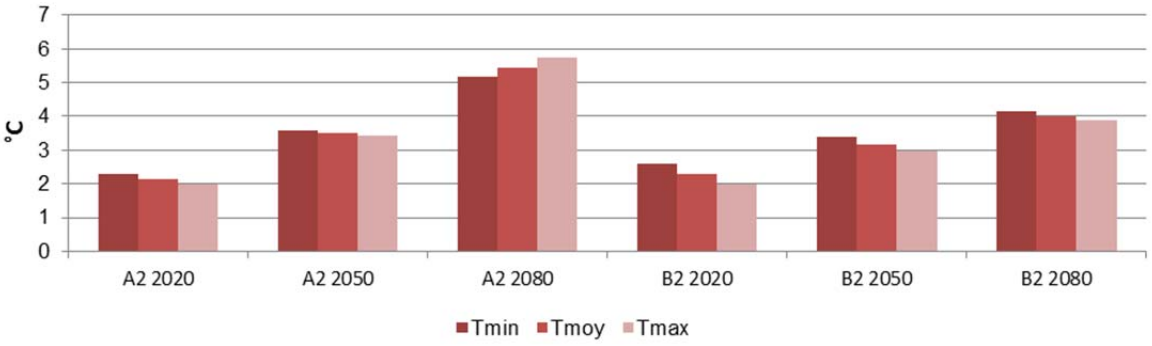
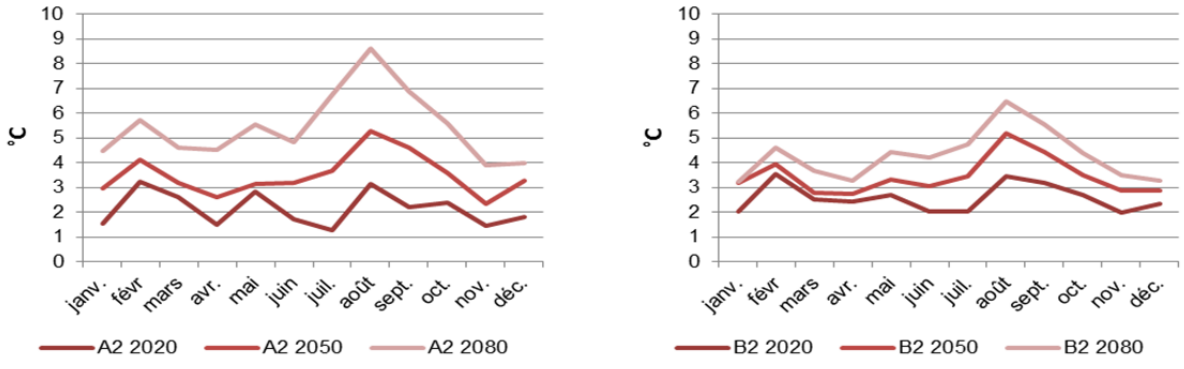


FIG 6.7 Anomalies mensuelles de température suivant les scénarios climatique A2 et B2



Evolution des précipitations

Le cumul annuel des précipitations évolue assez peu en particulier pour le scénario B2, par contre leur répartition au cours de l'année apparait modifiée. Cette répartition suit les mêmes tendances, quels que soient les scenarii A2 et B2 : celles-ci augmentent entre les mois d'octobre et mars (période automnale et hivernale), et diminuent les autres mois (période estivale). Les anomalies sont plus importantes pour le scénario A2 que pour le B2. Les différences sont d'autant plus importantes que l'on s'éloigne de la période actuelle. Ainsi l'évolution pluviométrique projetée est un renforcement du contraste entre la saison estivale, qui sera plus sèche, et une saison hivernale qui sera plus humide, en conservant un cumul annuel équivalent.

FIG 6.8 : Evolution des précipitations annuelles suivant les scénarios climatique A2 et B2

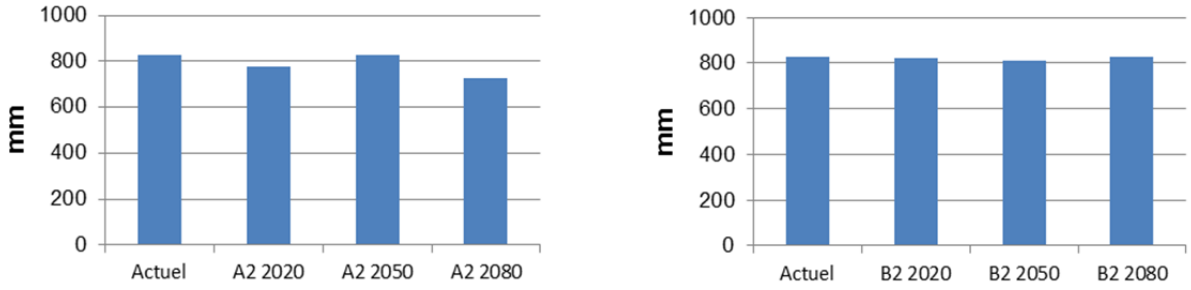
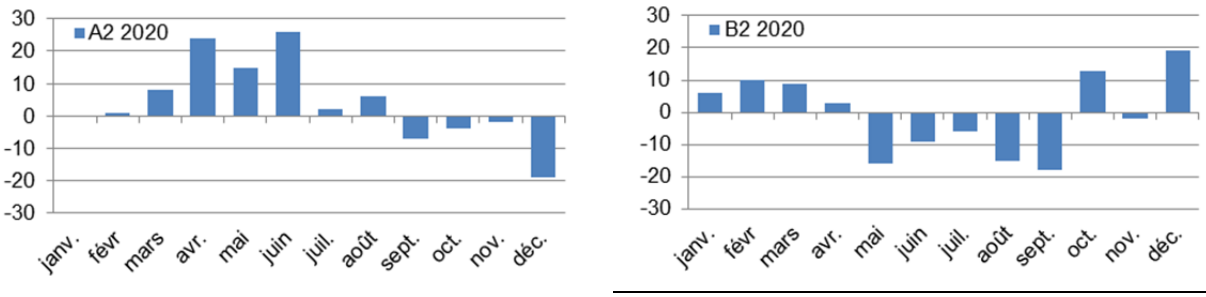


FIG 6.9 Anomalies mensuelles de pluviométrie en mm suivant les scénarios climatique A2 et B2



Evolution bioclimatique

La Principauté de Monaco, avec une moyenne des minimums les plus froids à 2,6 °C et un quotient pluviothermique de 126,2, appartient au sous-étage bioclimatique humide, selon la classification d'Emberger (1955).

Les évolutions des précipitations et des températures ont été interprétées suivant les scénarios A2 et B2 en terme d'évolution des caractéristiques bioclimatiques. Les deux scénarios montrent que cette caractéristique bioclimatique devrait évoluer notamment par la nature des hivers qui devraient devenir « tempérés », voire des hivers « chauds » selon le scénario A2 à l'échéance 2080.

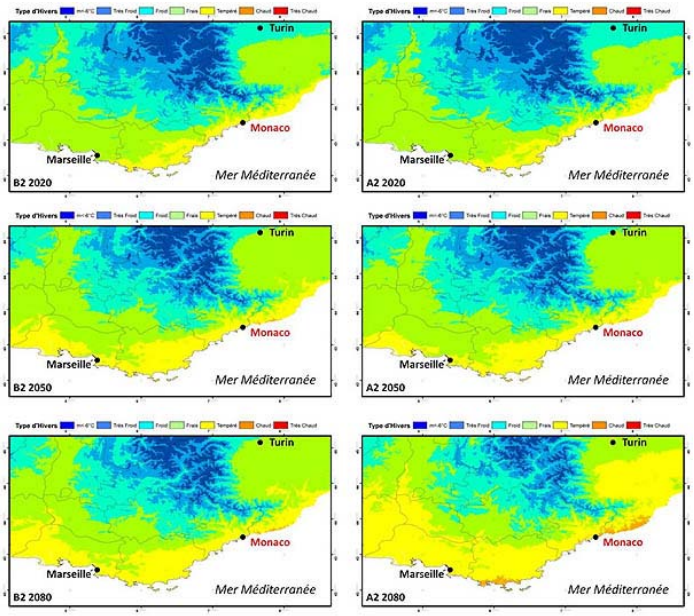
Tab 6.16 Évolutions mensuelles des degrés jour unifié de chauffage (DJU 18°C) suivant le scénario climatique A2

Scénario	Horizon	m en °C	Q	Type d'Hiver	Type de Bioclimat
Actuel	**1950-2000**	2,6	126,2	Hiver frais	Bioclimat humide
A2	**2020**	4,6	112,6	Hiver tempéré	Bioclimat humide
	2050	5,7	111,5	Hiver tempéré	Bioclimat sub-humide
	2080	7,2	88,0	Hiver chaud	Bioclimat sub-humide
B2	**2020**	4,8	116,8	Hiver tempéré	Bioclimat humide
	2050	5,9	110,2	Hiver tempéré	Bioclimat sub-humide

	2080	6,1	106,4	Hiver tempéré	Bioclimat sub-humide

Avec (m) la moyenne des minima du mois le plus froid et Q coefficient pluviométrique dépendant également du mois le plus chaud (M) et de (m).

Fig 6.17 Evolution des types d'hiver selon la classification d'Emberger de 1955 par la moyenne des minimums du mois le plus froid à l'échelle de la région Provence Alpes Côte d'Azur

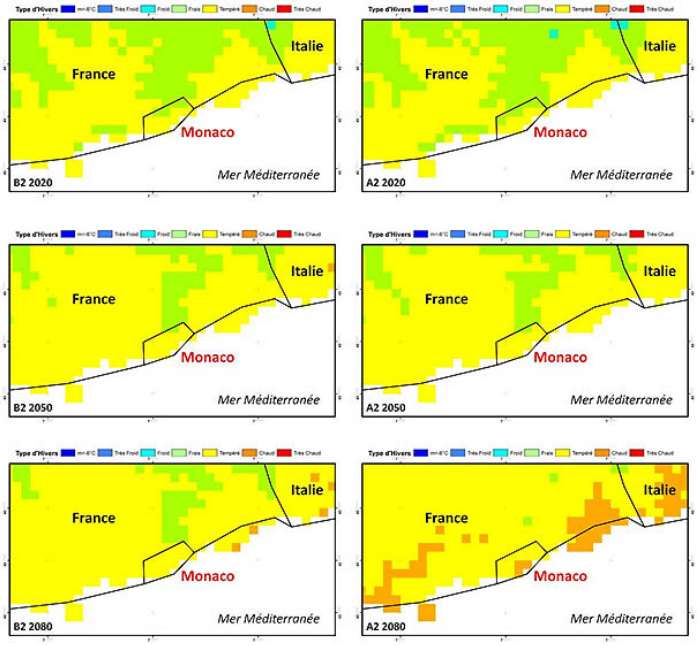


Ainsi, il est projeté une évolution du climat local vers des étages plus arides. Cependant ces modifications sont plus ou moins marquées suivant les scénarii et les horizons. L'évolution s'effectue plus rapidement vers une augmentation de la moyenne des minimums du mois le plus froid que dans une diminution du quotient pluviothermique. En 2050, le territoire de la Principauté de Monaco aura quitté le sous-étage humide.

Quel que soit le scénario, en 2020 les hivers seront de type "Frais et Tempéré", en 2050, ils seront uniquement de type" Tempéré".

En 2080, suivant le scénario A2, l'augmentation de la valeur du « m » est importante (+ 4,6°C), les hivers seront de type "Chaud" pour Monaco(tableau 6.16).

Fig 6.18 Evolution des types d'hiver selon la classification d'Emberger de 1955 par la moyenne des minimums du mois le plus froid Zoom sur la région de Monaco



2.5 Vulnérabilité, adaptation

Le diagnostic de vulnérabilité au changement climatique pour Monaco doit s'appréhender par les effets directs du changement du climat ; augmentation des périodes chaudes, stress énergétique, élévation du niveau de mer, changement des caractéristiques bioclimatiques, etc.

Cependant, de par la nature du territoire, et de sa taille, le diagnostic de vulnérabilité ne peut se limiter à ces effets directs et devra aussi s'appréhender de manière régionale notamment en matière de santé, de transport, d'énergie et d'eau.

D'ores et déjà, le renforcement de la connaissance des aléas climatiques et la mise en œuvre de plans de prévention constituent un axe de travail des politiques à venir.

Les effets sur le tourisme et les activités économiques sont plus difficiles à appréhender, il pourra en résulter aussi bien des impacts que des opportunités. Dans un pays exclusivement urbain tel que Monaco, l'évolution de la ville et de l'intelligence de ses services constitue un des enjeux majeurs pour limiter la vulnérabilité et assurer une adaptation du territoire au changement climatique.

2.5.1 Santé

Canicules

Les épisodes de canicule peuvent tuer de manière directe. Cependant Monaco dispose d'importants moyens d'action sociale, en particulier en matière de santé. Ainsi lors de la canicule de 2003, les services de secours et de santé n'ont pas noté d'augmentation significative des problèmes liés à la vague de chaleur, les tranches de population les plus sensibles bénéficiant d'informations et d'une surveillance particulière, voir individuelle.

Pollution de l'air

L'état de l'atmosphère joue un rôle important sur le niveau de pollution journalier et saisonnier, pollution photochimique en été et acido-particulaire en hiver.

Même si les niveaux d'émission de polluants atmosphériques sont en baisse importante, avec l'augmentation des températures et de l'ensoleillement, les conditions favorables à l'apparition de pics d'ozone pourraient intervenir plus fréquemment et pendant des périodes plus longues (du printemps à l'automne).

Les effets sur la santé seront d'autant plus importants que le Sud-Est de la France est déjà une région sensible à la pollution par l'ozone. A contrario des hivers plus doux pourront limiter les épisodes de pollution en hiver.

Parallèlement, l'ensemble des facteurs connus à ce jour laisse également penser que les risques allergiques liés à la pollution par les pollens seront accentués. Avec l'augmentation des saisons chaudes et de la production végétale, les saisons polliniques pourront être plus précoces et plus longues.

Emergence de maladies

Les risques liés au développement de maladies animales, non encore présentes, seront augmentés par la mondialisation des échanges et le développement de certains vecteurs comme le moustique. La région méditerranéenne est déjà considérée comme sensible du point de vue épidémiologique de par la densité des mouvements humains et commerciaux (ONERC-Changements climatiques et risques sanitaires en France, septembre 2007).

L'European Centre for Disease Prevention and Control (ECDC) (2009) rapporte que le moustique Aedes albopictus a été observé officiellement pour la première fois en Monaco en 2006 (données non encore publiées : F. Schaffner, communication personnelle) avec des premières plaintes concernant des nuisances enregistrées en 2007. L'introduction de cette espèce s'est effectuée en raison du trafic routier venant de l'Italie. La colonisation s'est faite par la suite de manière importante et rapide (Roumieux 2013).

Ce moustique est connu pour être le vecteur de la maladie du chikungunya. Il a une capacité à coloniser de nombreux types de collections d'eau, qu'elles soient d'origine anthropique ou naturelle, et le milieu urbain parait particulièrement adapté à sa survie et son développement (présence d'eau et de niches de chaleur).

FIG 6.19 Répartition européenne connue d'A.albopictus les observations de terrain du EDC/Vbornet (décembre 2011).

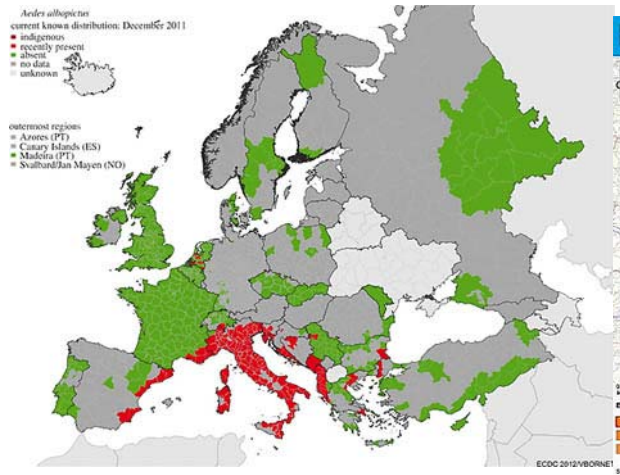
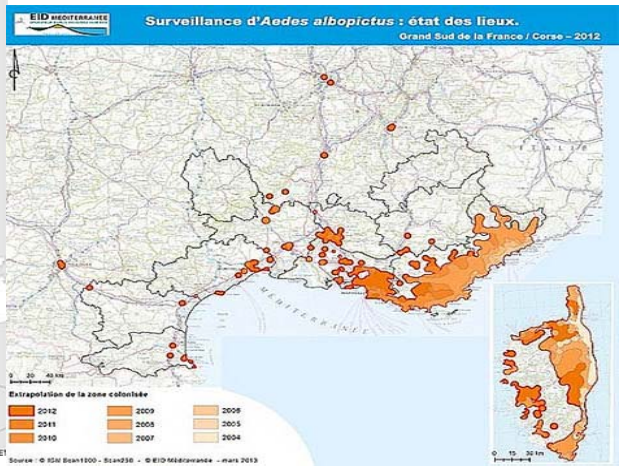


FIG 6.20: Surveillance de A.albopictus : état des lieux basée sur (grand sud de la France et corse 2012) EID Méditerranée. projet



2.5.2 Elévation du niveau des mers.

Avec l'hypothèse d'une élévation progressive du niveau de la mer et dans le cas d'une augmentation de la fréquence des évènements extrêmes, les aléas côtiers et le risque de submersion de certaines zones telles que les plages ou les ports pourront augmenter significativement.

2.5.3 Ecosystèmes

Dans le milieu marin, en dehors des stress thermiques observés sur la colonne d'eau, notamment en 1999 qui ont conduit à des mortalités massives de spongiaires, cnidaires (gorgonaires) et bryozoaires, des espèces indicatrices de modification de la biodiversité due au changement climatique ont déjà été observée à Monaco. Par exemple la prolifération d'algues filamenteuses et d'autres espèces exotiques.

Depuis une dizaine d'années, des suivis d'indicateurs biologiques sont réalisés. Ils portent sur des paramètres, tels que des suivis démographiques et dynamiques, des indices de vitalité et de nécrose (gorgonaires, échinodermes..), qui peuvent mettre en évidence des stress thermiques sur l'écosystème.

Depuis 2009, Monaco a déjà mis en place une procédure d'alerte et de secours liée à la présence de l'algue ostréopsis ovata, pouvant présenter un risque pour les baigneurs et les habitants du front de mer. Ostreopsis ovata est une algue microscopique unicellulaire, produisant une palytoxine, qui vit habituellement dans les eaux chaudes des mers tropicales. Des conditions climatiques favorables ont permis à Ostreopsis ovata de se développer sous nos latitudes en mer Méditerranée. L'habitat privilégié de cette algue microscopique se situe à la périphérie des macroalgues (algues rouges et brunes) et des efflorescences d'Ostreopsis ovata surviennent naturellement en mer sur notre littoral. L'accord RA.MO.GE est notamment en charge de soutenir et de faciliter le transfert d'informations sur cette problématique entre la France, Monaco et l'Italie.

2.5.4 Etudes d'incidences sur l'environnement

En matière d'aménagement du territoire, la prise en compte de l'environnement dans l'élaboration de projets urbanistiques se traduit par la réalisation d'Etudes des Incidences sur l'Environnement. Ces études visent à prévenir, limiter et réduire les impacts négatifs d'un projet sur l'environnement (naturel et anthropique) et, à mettre en œuvre, en dernier lieu, des mesures compensatoires.

La réalisation d'études d'incidences sur l'environnement est rendue obligatoire par le Code de la Mer, et l'Ordonnance Souveraine 3.647 du 09 septembre 1966 modifiée et les Ordonnances Souveraines de quartier qui en découlent, pour tout projet qui peut avoir des incidences, directes et indirectes, sur l'environnement marin.

Une circulaire Administrative à destination des architectes prévoit également, suivant la nature du projet immobilier ou d'infrastructure à réaliser, la réalisation d'études d'incidences sur l'Environnement.

2.5.5 Eau – Approvisionnement en eau

Monaco dispose de deux sources d'approvisionnement en eau, une eau produite localement et une eau importée.

L'eau produite localement provient des sources du bassin hydrogéologique majoritairement situées en territoire français et dont la Principauté constitue un exutoire. Il s'agit d'un bassin hydrogéologique karstique qui propose une capacité de stockage permettant, les années les plus favorables ont permis de fournir par les sources exploitées, presque 50% de la consommation de la Principauté.

L'eau importée vient majoritairement du bassin hydrologique du Var situé dans l'arrière-pays de Nice. Ce bassin bénéficie d'une situation climatique avantageuse qui cumule les effets des Alpes, de la mer ainsi que de plusieurs réservoirs karstiques naturels importants (Mercantour) et de la nappe du Var qui joue le rôle d'amortisseur.

Les ouvrages d'eau réalisés dès la fin du XIXe siècle (canal de la Vésubie) ont permis d'assurer de manière satisfaisante l'alimentation de la zone littorale malgré une population en croissance constante.

Les besoins en eau du bassin hydrographique tendent à se confondre avec les prélèvements destinés à la production d'eau potable qui représente 90 % des volumes produits.

En résumé cette zone est bien alimentée en eau et ne montre pas de conflits d'usage ce qui n'exclut pas des variations de hauteur de nappes significatives qui toutefois n'ont pas engendré à ce jour de mesure particulière même en cas de stress hydrique important.

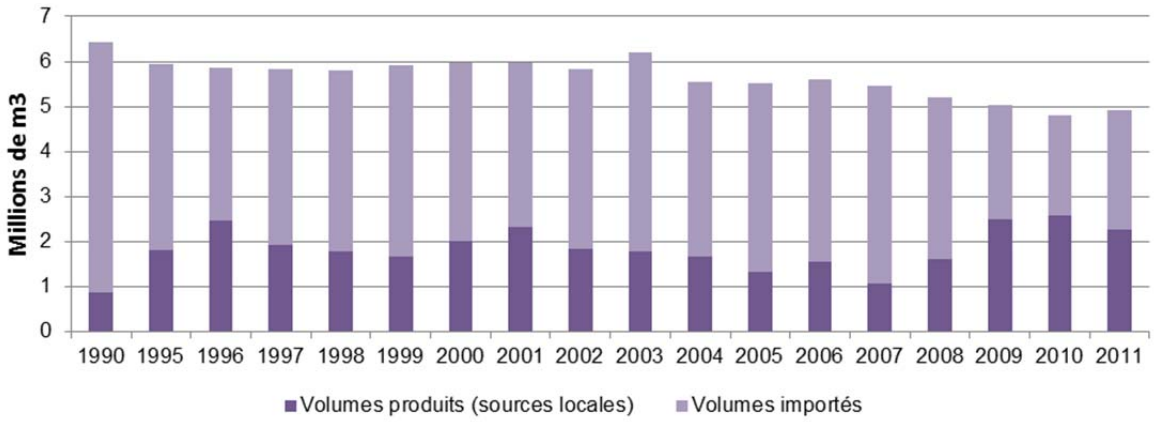
En 2007 un plan d'action sécheresse départemental a été approuvé dans les Alpes Maritimes, il fixe pour chaque zone des situations de vigilance, d'alerte, de crise et de crise renforcée, ainsi que les mesures correspondantes de restriction des usages d'eau.

Dans le cadre de ce plan sécheresse, les caractéristiques hydrologiques de la zone d'approvisionnement de Monaco n'ont pas fait l'objet de définition de seuil d'alerte et de débit de crise, seule doit être relevée l'importance des fluctuations de nappe.

Ainsi, le bassin qui approvisionne la Principauté en eau bénéficie, à ce jour, d'une situation tout à fait particulière en matière de capacité de production et de répartition des volumes, qui le met à l'abri des situations les plus restrictives en cas de sècheresse.

Toutefois, dans l'optique de diminuer le stress sur la ressource, la politique entreprise à Monaco vise à maintenir la production locale et à diminuer les consommations. Ainsi il a été enregistré environ 20% de baisse des consommations d'eau depuis 20 ans.

Fig 6.21 : Volumes et origine de l'eau consommée à Monaco de 1990 à 2011



2.5.6 Energie

L'étude de l'évolution des besoins en énergie thermique en degré jour unifié (DJU) a permis de projeter ce que pourrait être l'évolution des besoins en chaud et froid aux horizons 2020-2050-2080.

Cette estimation a été réalisée à partir d'une corrélation (réalisé sur les années 2005-2010) entre les DJU observés et les demandes en calories et de frigories pour le réseau de chaleur de Fontvieille.

Elle a permis d'établir deux équations liant les consommations et les DJU avec des taux de corrélation très satisfaisant.

Refroidissement (en été) : R = 0,9715 Calorie(MWh) = 10,695 x DJ15 + 1668

Chauffage (en hiver) : R = 0,9396 Calories(MWh) = 9,21 x DJU18 + 888

Ces corrélations appliquées à l'évolution prévue pour les degrés jours à Monaco selon les tendances climatiques des scénarios A2 et B2 montrent qu'à périmètre constant, en 2020, les consommations en frigories devraient augmenter de 33% selon le scénario A2 et de 35% selon le scénario B2. Ces augmentations devraient être de respectivement de 58% et 51% en 2050. En 2080, il est projeté environ 70% d'augmentation pour le scénario B2 et un doublement (+100%) de l'énergie frigorifique à fournir pour le scénario A2.

L'effet inverse est observé pour les consommations en calories. L'hiver, en 2020, les besoins devraient baisser de 35% selon le scénario A2 et de 41% selon le scénario B2. En 2050, les besoins

devraient baisser de 50% pour les deux scénarios. En 2080, les besoins devraient baisser de 70% selon le scénario A2 et de 60% selon le scénario B2.

Fig 6.22 Evolution de la consommation énergétique du réseau de chaud et de froid de Fontvieille selon les scénarios A2 et B2 – Evolution de la consommation de froid.

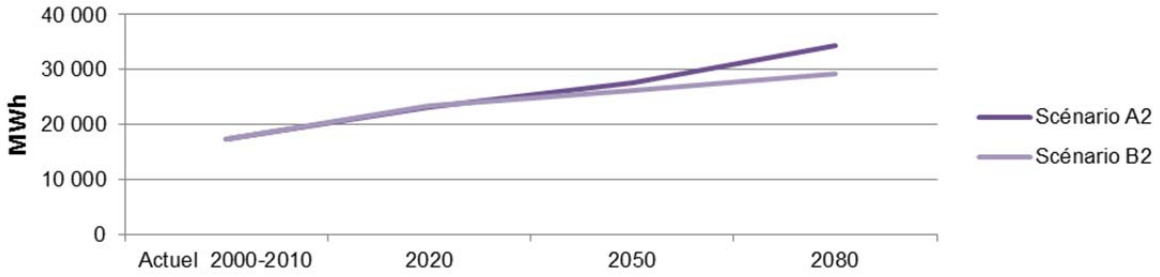
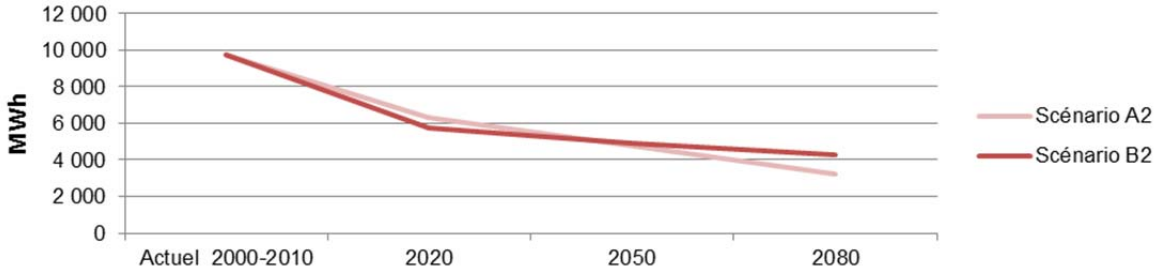


Fig 6.23 Evolution de la consommation énergétique du réseau de chaud et de froid de Fontvieille selon les scénarios A2 et B2 – Evolution de la consommation de chaud.



2.5.7 Smart cities

Le concept de ville intelligente s'est progressivement imposé au cours des années 2000 en termes de réflexions pour imaginer la ville du futur.

Ces concepts répondent à des besoins actuels comme ceux liés à la réduction de l'empreinte environnementale, notamment dans le domaine énergétique, et anticipent les besoins futurs, en particulier pour limiter la vulnérabilité du territoire par rapport à des évènements ponctuels et à plus long terme au changement climatique.

Face à ces enjeux, Monaco a conduit une étude pour la définition d'un cadre de référence sur les villes intelligentes et pour identifier les points forts de la Principauté, ses points faibles, ses axes de progrès, et quelques projets concrets à privilégier pour mettre Monaco sur la trajectoire d'une Smart city (Nomadeis –Note de cadrage- Monaco ville intelligente 31/01/2014).

A ce jour, plusieurs projets pilotes sont en cours, en matière de mobilité, de performance énergétique et mettant en œuvre des Technologie de l'information et de la communication (TIC).

Monaco a signé, en fin d'année 2013, un Accord-cadre de coopération avec le Commissariat à l'énergie atomique et aux énergies alternatives (CEA) dans le domaine des énergies renouvelables, de l'efficacité énergétique et de la mobilité durable. Le premier axe de travail, prévu en 2014, correspond à l'étude du renforcement de l'efficacité énergétique du réseau de distribution de chaud et de froid urbain par l'adjonction de technologies propres de production et de stockage de l'énergie et l'amélioration de l'exploitation du réseau.

NORWAY / NORVÈGE

BERN-CONVENTION: IMPLEMENTATION BY PARTIES OF RECOMMENDATIONS NO. 159 (2012) OF THE STANDING COMMITTEE ON THE EFFECTIVE IMPLEMENTATION OF GUIDANCE FOR PARTIES ON BIODIVERSITY AND CLIMATE CHANGE

REPORT FROM NORWAY

Introduction

Norway is expected to become warmer and wetter during the next century. The temperature will rise most in winter, particularly in the north. Precipitation will increase in autumn, winter and spring, especially in West Norway. Satellite-based mapping indicate that the growing season has increased since the 1980's by up to 2-4 weeks in parts of Norway. Melting of permafrost has been observed in recent years.

Impacts of climate change on Norwegian ecosystems

The effects of climate change have already been observed on terrestrial ecosystems in Norway. Earlier arrival of migrating birds, earlier sexual maturation in some animals, higher production and reproduction in both plants and animals, and earlier budding and pollen production are some of the changes observed. There are also some signs of plant species having expanded northwards or to higher altitudes.

Alpine and tundra ecosystems: Alpine and tundra ecosystems are regarded as particularly vulnerable to climate change. Climate change is expected to cause the tree line and vegetation zones to creep upwards in altitude, which in turn will affect species in the mountains. Some high-alpine or arctic species, such as the polar bear and the Arctic fox, may run out of suitable habitats to move to in the future, increasing extinction risk for these species and exacerbating the management challenges. The shift in species distribution up mountains and towards the North Pole also leads to competition from new species, such as the red fox which migrates to alpine areas and competes with the arctic fox.

Forest ecosystems: For forest ecosystems, a longer growing season will result in faster growth and primary production, a rise in the proportion of trees that prefer a warmer climate and perhaps changes in species composition with broadleaf species replacing pine and spruce in the south. Climate change may result in increased forest damage by factors such as pest outbreaks, drought, and forest fires. Such factors can be serious threats to forest health, vitality and productivity. Some cultural landscape systems, such as species rich hay meadows or grazed grasslands, are vulnerable to increased growth and primary production. This will enhance the threat from re-growth due to abandonment of agricultural practices to species and ecosystems associated with the cultural landscape.

Wetlands: Wetlands, especially bogs, have also been exposed to major human encroachment, such as drainage for agricultural purposes, forestry, harvesting of firewood and peat moss, as well as other development. More precipitation results in further erosion of wetlands in many areas with such encroachment. Climate change represents a new threat to wetlands that work in combination with other stress factors. This applies in particular to Southern and Eastern Norway where one expects higher temperatures and less precipitation in summer as well as to certain types of wetlands, such as

palsa mires which may melt in a warmer climate. Increased precipitation in other parts of the country can lead to an increase in wetland areas.

Freshwater ecosystems: The effects of climate change on the freshwater ecosystem are many and complex, and they will have impacts on production, biomass, life cycles and species composition. Together with an increase in extreme precipitation events and flooding, this will result in more runoff, transport of particulate matter and leaching of nutrients and other pollutants. Higher erosion rates along river banks and runoff of particulate matter and nutrients from farmland may become more of a problem, and such tendencies have already been registered in smaller rivers in Eastern Norway. Particulate matter and pollutants are transported downstream to coastal waters, adding to the overall environmental pressure on marine ecosystems. In freshwater systems, the ice-free season will be longer, the water temperature will increase, and the thermal vertical stratification in the lakes will increase. In parts of Norway, prolonged periods of summer drought and low water flow are expected. For vulnerable fish species such as salmon, trout and Arctic char, sustained temperatures exceeding 20ºC could be critical. Regulated rivers with low residual flows may be particularly exposed. In addition, the spread of new (native or alien) species associated with climate change, will potentially have large impacts on freshwater biodiversity in the future.

Marine waters: In marine waters, climate change will result in higher temperatures, and a higher CO2 content in sea water will lead to ocean acidification. This in turn may cause serious impacts on marine ecosystems. Ocean acidification will result in changes in the seas' ability to precipitate calcium carbonate, on which calciferous organisms depend. This problem increases at great depths with high pressure and low temperatures, implying that Norwegian waters and especially the Polar Regions are particularly exposed and will be impacted before more temperate regions. Reduced pH in surface waters has already been observed in Norwegian waters. There are many cold-water coral reefs in Norwegian waters, including the world's largest known cold-water coral reef complex. Coral reefs are among the most species-rich ecosystems, and are a vital habitat for many types of fish. Ocean acidification has negative impacts on these ecosystems, and by the end of this century, up to 70 per cent of the calciferous organisms related to coral reefs in Norwegian waters are expected to show signs of erosion. Phytoplankton, as e.g. calciferous flagellates, form the basis of marine ecosystems, and the zooplankton that graze on them are essential food for many fish species. As abundance of plankton species with calcareous skeletons may be reduced in more acidic seawater, ocean acidification can have major impacts on many trophic levels.

The higher water temperatures lead to northwards migration of different species. With its great depths, the Norwegian Sea is a key area for the production of copepods (zooplankton). They represent an important food source for fish larvae and fry for the large boreal fish stocks, such as herring and mackerel. In the North Sea, quantities of the common copepod *Calanus finmarchicus* have dropped considerably as the sea temperature has risen; at the same time, the quantities of a plankton species that prefers higher temperatures have increased. This species is however less nutritious. A decline in *C. finmarchicus* and an increase in plankton species that spawn later in the season may result in a mismatch between spring-spawning fish and their prey, and also between seabirds and marine mammals and the herring. Along with a northwards migration of copepods, the southern boundary for boreal fish species is expected to move northwards. Species such as cod, haddock, herring and mackerel may have their migration patterns disturbed. However, in the 21st century, several temperate and subtropical fish species, such as sardine, anchovy, European bass and tuna, may become more common in the North Sea. In the Arctic, fish species such as Arctic char and polar cod may disappear from parts of the Barents Sea with the retreating sea ice, since they primarily feed on the arctic zooplankton whose natural habitat is along the ice edge. Seabirds along the coast are subject to a range of different pressures, many of which are caused by human activity – oil pollution, competition with fisheries, climate change (increasing sea temperatures), marine litter, persistent organic pollutants, introduced predators, habitat degradation and disturbance by people. Many seabird populations have shown a dramatic decline in recent years. Moreover, a number of seabirds are specialised feeders, which makes them particularly sensitive to climate change and changes in the availability of prey species such as sandeels, herring and capelin.

Alien species: A Norwegian assessment - *Alien Species in Norway - with the Norwegian Black List 2012* -has shown that many invasive alien species (e.g. pondweed *Elodea canadensis*, pacific oyster *Crassostrea gigas*, Chinese mitten crab *Eriocheir sinensis*, giant hogweed *Heracleum mantegazzianum*) will find conditions more favourable with climate change, hence increasing the threat to indigenous species. Up until now, cold winters have prevented many alien species form establishing viable, reproductive populations in Norway. With less severe winters these species may become invasive.

Main management challenges: In general, the threats posed by climate change are additional to other stressors, such as land use change causing habitat destruction and fragmentation, pollution and overexploitation. Therefore, management of natural systems needs to take the cumulative effects of stressors into account. Ensuring corridors for migration and combating habitat-fragmentation to reduce barriers for movement are main challenges for nature management. Another general and important population management aspect is to ensure large enough populations with high genetic variability to enable climate change adaptation through natural selection. However, in many cases adaptation to climate change will be restricted to minimising other threats. Hence, the responsibilities of different sectors for securing natural diversity and sustainable development according to laws and regulations are crucial. Due to the complexity of natural systems, ensuring necessary capacity and understanding within the different sectors, is a major challenge in itself.

Climate change mitigation policies

The Norwegian government presented its efforts on climate mitigation in a White Paper for Stortinget (the Parliament) in May 2012 (*Norwegian Climate Policy* – Report to the Storting no 21 (2011-2012)). Funded as basis for the Norwegian climate policy are important environmental principles such as the precautionary principle, the ecosystem approach and cumulative environmental effects, and the polluter pays principle, extending beyond the scope of pollution. Also, the policy states that “one will prioritize measures that have positive effects for both reducing greenhouse gases and for securing biodiversity and other important environmental values”. The concern for biodiversity and need for developing environmental criteria for the different measures, are present throughout the paper.

In 2010 a national commission presented a report on mitigation measures and actions available in order to reach the national goal for greenhouse gas reduction for 2020 (*Climate Cure 2020: Measures and instruments for achieving Norwegian climate goals by 2020*). A review (in Norwegian) evaluating the potential conflicts with biodiversity of all the possible mitigation measures listed in this report was afterwards made by the Norwegian Directorate for Nature Management. Both these reports have been used as background documents for the White Paper on climate mitigation.

In 2013 the two Norwegian governmental agencies for environmental protection (the Norwegian Climate and Pollution Agency and the Directorate for Nature Management) were merged into one – The Norwegian Environment Agency, which encompasses work on all fields of environmental management. The Norwegian Environment Agency will during 2014/2015 provide a new assessment of mitigation measures and instruments towards 2030 that will serve as a scientific basis for Norway's commitments for a new international climate agreement that will be discussed within the UNFCCC international climate negotiations in Paris in 2015. This assessment will also describe Norway as a low emission society in 2050.

To be able to reach the Norwegian goal of reducing global greenhouse gas emissions by the equivalent of 30% of Norway’s 1990 emissions by 2020 (*Norwegian climate policy* – Report to the Storting no 34 2006-2007 (in Norwegian)), further measures need to be implemented. Since 2007, several measures and instruments have been implemented in Norway, for example higher emission standards on private cars, reduced taxation of electric cars, improved waste management, phasing out oil boilers for domestic heating, increased use of biofuel and technological improvement in production of fertilizers. However, this effort is not sufficient (Norwegian Environment Agency, 2014, Scientific basis for further development of national and international climate policy, M-133 (in Norwegian)). Without any additional mitigation strategies than those already initiated, there is a gap of 8 million tons CO_2-equivalents in 2020 in order to meet the national target of a 30% reduction. Further

restrictions in all sectors is therefore necessary, i.e. more efficient cars and higher share of electric and hybrid cars, electrification from land of all new oilfields offshore, more biofuel, and that at least one large scale carbon-capture-and-storage plant is in place before 2020. Possible actions include measures that have potential conflicts with biodiversity, such as development of renewable energy (wind power plants, water power plants, production bioenergy, etc.). Generating sustainability criteria for such development will be of great importance in the near future.

The Norwegian Parliament wants to increase carbon uptake in forests to mitigate climate change, by (i) increasing the forested area, and (ii) fertilizing coniferous forests with nitrogen to increase forest biomass and carbon uptake as climate measures (*Norwegian Climate Policy* - Meld.St. nr 21 (2011-2012)). On request from the Ministries for Climate and Environment and Agriculture and Food two reports, one on afforestation and one on fertilization (both in Norwegian), evaluating environmental criteria and potential areas for these measures have been published and presented for the ministries. The reports have been developed by the Norwegian Environmental Agency in cooperation with the Norwegian Agricultural Authority and the Norwegian institute for Forest and Landscape.

Climate change adaptation policies

A fundamental principle of climate change adaptation in Norway is that the actor responsible for the work is the actor responsible for the task or function affected by climate change. In consequence, everyone has a responsibility for climate change adaptation: individuals, households, private businesses and the public sector.

The responsibility for assisting the Ministry of Climate and Environment in climate change adaptation matters is, as of 1 January 2014, with the Norwegian Environment Agency.

In 2007, the Norwegian government established an inter-ministry working group to facilitate the efforts related to climate change adaptation (CCA). The working group was constituted by 10 ministries, headed by the Ministry of Climate and the Environment (now the Ministry of Climate and Environment) and was until 2013 supported by a Programme Secretariat established at the Norwegian Directorate for Civil Protection and Emergency Planning (DSB). In 2008 the government launched an initial 5 year work programme (only in Norwegian) focusing on enabling activities for adaptation at sectoral and various administrative levels. Its three pillars are 1) identifying vulnerabilities and integrating CCA in key policy areas, 2) developing the knowledge base including research and a national vulnerability and adaptation assessment, 3) information and coordination, including a national clearing house (www.klimatilpasning.no) and other capacity building efforts.

In 2010 an Official Norwegian Report titled "*Adapting to climate change*" (NOU 2010-10, English version) was published. In this report, a committee appointed by the Government assessed Norway's vulnerability to the effects of climate change and the need to adapt. This NOU incorporates many of the aspects described in the Intergovernmental Panel on Climate Change (IPCC) Technical Guidelines for Assessing Climate Change Impacts and Adaptations and the United Nations Environment Programme (UNEP) Handbook on Methods for Climate Change Impacts Assessment and Adaptation Strategies. The Norwegian Official Report from 2010 on climate change adaptation gives an overview of risks of climate change on different parts of the society: health and safety, physical infrastructure, trade and the natural environment. It also identifies and prioritizes tools and means for reducing vulnerability and increasing adaptation ability. Many of the sectors covered in the report (e.g. land transport, buildings, agriculture, energy supply) have already conducted climate change vulnerability analyses and included climate change into their sectoral policies

Following the Official Norwegian Report on climate change adaptation, the Norwegian government in May 2013 presented a White Paper on climate change adaptation (Norwegian Climate Adaptation Policy – Report to the Storting no. 33 (2012-2013 (in Norwegian)), which focuses on the challenges associated with climate change and how Norway can become more resilient in the face of climate change. The White Paper provides an overview of the implications of climate change for Norway and sets out a framework to facilitate the development of adaptation strategies and identification of effective adaptation measures. The White Paper address the concern for biodiversity as a priority issue, reflecting both the requirements of the Norwegian Nature Diversity Act of 2009

(English translation), and the recommendations in the Official Norwegian Report on climate change adaptation.

In the White Paper on adaptation to climate change the Government emphasises their intentions to ensure that the knowledge base for climate change adaptation is strengthened through closer monitoring of climate change, continued expansion of climate change research and climate change communication. Knowledge is essential for effective climate change adaptation – both knowledge about climate change and its impacts, and knowledge about possible measures and policy instruments to adapt to a changing climate. Adaptation works must always be based on the best available knowledge about climate change and how the changes can be addressed. Projections of future climate change are fundamental to climate change adaptation. As a precautionary approach, assessments of the impacts of climate change should be based on figures from the high end of the range of national climate projections. Climate change creates a need for a generally available service that provides information on the current and future climate change and translates climate science into practical adaptation work. Norway's Centre for Climate Services was established in 2011. One important reason for developing climate services is to provide support for climate change adaptation at local governmental levels and by sectoral authorities.

The White Paper on climate change adaptation also conveys plans to draw up central planning guidelines describing how the municipalities and counties should integrate climate change adaptation into their land-use and general planning processes. The new guidelines on climate change adaptation will be incorporated into existing guidelines for climate change mitigation and energy planning.

Stormwater management: Several different authorities administer the legislation and determine the framework for municipal stormwater management in urban areas. Examples of the most important legislations are the Planning and Building Act, Water Resources Act, Pollution Control Act. However, there is a need for clearer rules and a better framework for municipal stormwater management. As a response to this, the Norwegian Government has appointed a committee to evaluate the current legislation and as appropriate make proposals for amendments to provide a better framework for the municipalities, which will have to deal with increasing volumes of stormwater as a result of climate change. The secretariat for the committee sits with the Norwegian Environment Agency.

Ecosystem-based approaches and cross cutting issues

Through various international agreements, Norway has committed to a number of goals and strategies related to management of the natural environment. Climate Change and Biodiversity is a cross-cutting program under the Convention on Biological Diversity (CBD). Norway implements the program through the follow up of decisions from CBD. Norway is developing their national target goals following the 10th Conference of the Parties to the Convention on Biological Diversity in Nagoya in 2010 and the Strategic Plan for Biodiversity 2011-2020. In this work, climate change adaptation and capacity of ecosystems to counteract effects of climate change on society will be included. At the next meeting of the Subsidiary Body of Scientific and Technical Advice (SBSTTA) June 23-28, climate change is on the agenda under the following topic «Integration of the conservation and sustainable use of biodiversity into climate-change mitigation and adaptation activities». Norway's fifth national report to the CBD is under finalization and will include information about the progress in the implementation of the CBD Strategic Plan 2011-2020 and other relevant CBD decisions.

A major contribution to the ecosystem-based management of freshwater is the comprehensive and cross-sectoral planning under the Water regulations, which implement the EU Water Framework Directive in Norway. The regulations state that water must be managed as a whole, from mountain to fjord; surface water, groundwater and coastal waters must be viewed in context. Regional plans are developed for all water regions, and include monitoring programmes and measures to reach the environmental goals.

According to the Norwegian Nature Diversity Act of 2009, environmental considerations must be included in any public decision; hence the issues of climate change and environmental considerations, such as biodiversity, should be included in all sectoral policies. The Nature Diversity Act also has a separate chapter on the importation and introduction of invasive alien species into the environment. In

addition there are several regulations in place or under development, which together provide Norway with a comprehensive and coordinated regulatory framework for better control of invasive alien species.

The White Paper on Climate change adaptation in Norway constitutes the national strategy for adaptation measures, including for the natural environment. In the White Paper the Government acknowledges that climate change will alter Norway's natural environment and entail a growing risk of losing characteristic species and habitats. Hence, climate change adaptation must be designed to support the capacity of species and ecosystems to adapt to rising temperature, and to avoid any increase in vulnerability of the environment. The White Paper points to the importance of the principles that decisions that affect the environment should be based on scientific knowledge of the impacts of environmental pressures and on assessments of the cumulative environmental effects on ecosystems. These principles are stated in the Norwegian Nature Diversity Act and must be followed when conducting decisions affecting nature. The White Paper also focuses on that the natural environment can function as a buffer against many negative impacts of climate change. For example, vegetation plays an important role in preventing erosion and damage that are potential consequences of increased precipitation and more intense precipitation events.

The Norwegian Directorate for Nature Management in 2007 published a report covering climate change adaptation issues within nature management (*Climate Change – Nature Management* (Norwegian Directorate for Nature Management Report 2007-2)). Nature management measures with regard to climate change are to a large extent based on this report, and climate change adaptation measures have been integrated into existing management structures. Focus areas have been protected areas, cultural landscapes, freshwater systems, marine systems, game management, alien invasive species, areal planning and areal use and outdoor recreation.

Securing a representative network of land areas through national parks and other protected areas are important for plants and animals that need to migrate as a consequence of climate change. In the existing work on expansion and adjustment of protected areas in Norway, these considerations are already being included. Norway has, for example, submitted more than 600 sites as candidates to Emerald Network. In the Norwegian national park plan, 27 % of the mountain areas will be protected. For wild reindeer, regional plans developed in 2012, will also contribute to ensuring comprehensive living areas for the species in the future. Also for the forest ecosystems, protected areas are important. A forum has been established for cooperation between agricultural and environmental managements, which will encourage climate adaptation in forests. There are also a number of national and regional environmental programmes and measures aimed at securing cultural landscapes threatened by increased growth and regrowth. Wetlands are particularly important with regard to climate change. Ecosystems along rivers are known as one of the most important insurances against flooding and erosion, and securing and restoration of wetlands are regarded as win-win measures, which reduce the climate vulnerability, stores carbon and secure the habitats of many species. A number of wetlands are protected, and a national plan for restoration of wetlands is under development.

A primary objective is to protect the structure and function of the ecosystems, and development of ecosystem-based management systems (developed on the basis of the Malawi Principles, laid down in the CBD) is an important tool. As of spring 2013 integrated management plans are in place for all Norwegian marine areas (i.e. Barents Sea and Lofoten, the Norwegian Sea and The North Sea and Skagerrak). The management plans are based on the ecosystem approach. They facilitate coexistence and coordination between different commercial activities such as oil and gas extraction off-shore, maritime transport, fisheries, and other emerging activities such as off-shore renewable energy production. To this end, the management plans provide a framework for both existing and future commercial activities, while sustaining the ecosystems structure, function and productivity.

A report on the importance of Norwegian ecosystems with regard to climate adaptation and mitigation was published in 2012, entitled "*Climate and ecosystem services. The potential of Norwegian ecosystems for climate mitigation and adaptation* – NINA Report 791- 2012 (English abstract). Furthermore, in 2013, a Norwegian Official Report on values of ecosystem services (*Natural benefits – on the values of ecosystem services* (English summary)) was presented by an expert commission. In summary, the Commission concludes that the ecosystem services approach can be a

useful supplement to Norway's environmental and resource management in order to show more clearly why protecting nature is important to our own well-being. The Commission argues that the values of ecosystem services must be better demonstrated and reflected in decision making, and that values in nature must be communicated through policy instruments and framework conditions. In the Commission's opinion the state of Norwegian ecosystems in summary is relatively good, but Norway's biological diversity and Norwegian ecosystems are also under pressure from many stressors. Key factors include land use and land use change, as well as climate change and ocean acidification, pollution, environmental toxins and invasive species. The Commission makes a set of recommendations on the need for improved knowledge about biological diversity and ecosystem services in Norway. They see a particular need for more knowledge in a number of areas, including ecosystem services that are particularly important to climate regulation, climate change adaptation and public safety. The Commission also argues that measures to counteract climate change must be considered in relation to their effects on biological diversity and other environmental values. These two reports will be an important input to nature management in the development of further adaptation and mitigation actions, including and insuring ecosystem-based approaches.

On request from the Ministry for Climate and Environment, the Norwegian Environment Agency will in 2014 start an evaluation on the effects of climate change on the natural environment, ecosystems and biodiversity in Norway based on the scenarios in the 5th Assessment Report from the IPCC published in 2013 and 2014. Possible adaptation measures to increase resilience and reduce vulnerability of the natural environment will also be evaluated, as well as ecosystem services such as carbon sequestration, maintenance of biodiversity and flood-regulation by wetlands and old forests.

At the Norwegian Environment Agency, challenges related to climate change are similar for many of the thematic areas, e.g. with regard to the focus on cumulative effects or need to focus on ecosystem services. Therefore, climate change effects and adaptation need to be addressed multidisciplinary to ensure information and collaboration across different divisions at the directorate.

Research and monitoring

Extensive targeted research relevant for climate change adaptation has been carried out in Norway. Research and dissemination on basic climate change science is to a large extent funded through public funds. An extensive 10-year research program Climate Change and Its Impacts in Norway (NORKLIMA), ran between 2004 and 2013, aimed at generating vital new knowledge about the climate system, about climate trends in the past, present and future, and about the direct and indirect impacts of climate change on the natural environment and society, as a basis for adaptive responses by society. A new large-scale Climate Programme (KLIMAFORSK) has succeeded the NORKLIMA program in 2014. The primary objective of this large-scale Climate Programme is to generate essential future-oriented knowledge about the climate to the benefit of society, of national and international significance.

Norwegian researchers participate actively in international research collaborations such as EU funded programs, and contribute extensively to the work of the Intergovernmental Panel on Climate Change (IPCC). In 2013 the climate research was funded by 400 mill Norwegian kroner which are twice the public funds in 2005. The climate research is carried out by universities, university colleges and research institutes.

The monitoring programmes established on terrestrial ecosystems, palsa mires, common birds, and mountain vegetation and the monitoring at the Norwegian bird-ringing stations are the most relevant monitoring programmes in Norway today on linkages between climate change and biodiversity. These programmes have been followed up with new data collection in recent years. Existing monitoring activities in freshwater and marine ecosystems give additional knowledge on climate change effects. These programmes have been reviewed during the last years with respect to climate change effects, and supplementary activities have been proposed, but not started yet due to lack of financial resources.

Vulnerability assessments

In Norway, several specific vulnerability assessments for species and natural systems with regard to climate change have been conducted, e.g:

- *Monitoring of ocean acidification in Norwegian waters*, TA-3043, 2012 (English summary)
- *Changes in Norwegian marine benthic fauna 1997-2010*, DN utredning 8-2011 (English abstract)
- *Effects of climate change on seashores*, NINA Rapport 667-2011 (English abstract)
- *Atlantic salmon in future climates: Review on current knowledge and scenarios with focus on water discharge and temperature*, NINA Rapport 646-2010 (English abstract)
- *Climate change and Norwegian vegetation. How are Norwegian vegetation models affected by climate change?* NINA Rapport 524-2009 (English abstract)
- *Alien species and climate change in Norway: An assessment of the risk of spread due to global warming*, NINA Rapport 468-2009 (in English)
- *Adaptation to climate change and Northern Norway and Svalbard. An assessment for the need for new protected areas and terrestrial ecosystem's ability to bind carbon*, NINA Rapport 436-2009 (English abstract)
- *Climate and effects on ecosystems and biodiversity – a scenario for a mountain summer farming landscape in Valdres*, DN utredning 2008-10 (English abstract).

However, in many cases climate change vulnerability analyses are being integrated into broader vulnerability analyses, such as in the Action plan for seabirds in Western-Nordic areas (2010), or following up of the different marine management plans (The Barents Sea and Lofoten, the North-Sea and Skagerak) - or as part of the assessments of the environmental state of water regions in Norway, conforming to common implementation strategy for the water framework directive (2000/60/EC).

In addition, specifically for the Bern convention species, analysis of climate vulnerability has been conducted in connection with development of action plans (in Norwegian) for several species, including:

- *Anser erythropus*, *Emberiza hortulana* & *Limosa limosa* (birds)
- *Margaritifera margaritifera*, *Osmoderma eremita* & *Parnassius mnemosyne* (invertebrates)
- *Dracocephalum ruyschiana* & *Najas flexilis* (plants)
- *Alopex lagopus* (mammal)

With regard to migratory birds, long-term monitoring of the dates of arrival, breeding and autumn migration and time of egg-laying has been studied in several species and in general migrating passerines as part of surveillance programmes in Norway. It has e.g. been shown that spring migration and nesting in most species wintering in Europe or Africa have shifted to earlier dates in the past three decades: the pink-footed goose arrives 3 weeks earlier now compared with 20 years ago and the time of egg-laying has shifted to earlier dates in several species. In general it's difficult to predict the influence climate may have upon birds, some have a better potential to cope with it and other will be affected negatively. But the existing data show that the composition of bird fauna in Norway is changing and that populations for a high number of species will be affected.

POLAND / POLOGNE

THE GENERAL DIRECTORATE FOR ENVIRONMENTAL PROTECTION

INFORMATION ON THE IMPLEMENTATION OF RECOMMENDATION NO. 159 OF THE STANDING COMMITTEE, ADOPTED ON 30 NOVEMBER 2012 ON THE EFFECTIVE IMPLEMENTATION OF THE GUIDELINES FOR PARTIES ON BIODIVERSITY AND CLIMATE CHANGE

Warsaw, 2014

The report below is based on Recommendation No. 159 (2012) of the Standing Committee of *the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention).* This recommendation approved on 30 November 2012 obligates the Parties to the Convention to take action to overcome the effects of climate change and raise public awareness in this regard.

1. The Ministry of the Environment issued a Strategy on adaptation to sectors and vulnerable areas to climate change by 2020, with the prospect to the year 2030 (SPA 2020).

SPA 2020 indicates the objectives and directions of adaptation measures to be taken in the most vulnerable sectors and areas in the period up to 2020: water management, agriculture, forestry, biodiversity and NATURA 2000 sites, health, power industry, construction, transport, mountainous areas, coastal zone, spatial planning and urban areas. The sensitivity of these sectors has been determined on the basis on accepted for SPA's climate change scenarios. There were proposed objectives, courses of action and the specific actions that correspond with the strategic documents, in particular the Medium-Term Country Development Strategy - 2020 and other development strategies and at the same time, they provide the necessary complement in the context of adaptation. The current and predicted climate change have been taken into account and analysed, including climate change scenarios for Poland to 2030, which showed that during that period the greatest threat to the economy and society will be an extreme weather and climatic conditions (torrential rains, floods, flooding, landslides, heat waves, droughts, hurricanes, etc.). These phenomena will occur with increasing frequency and intensity, and will cover more and more areas of the country. There was proposed a system of implementation of the strategic plan, identifying responsible entities and indicators for monitoring and evaluating the implementation of the objectives. There has been also estimated the cost of losses incurred as a result of extreme weather and climate in Poland in 2001-2011, and estimated costs of adaptation measures in EU financial perspective 2014-2020. The framework for financing the implementation of activities in the perspective of 2020 was indicated, taking into account the opportunities offered by EU funds for 2014-2020.

In formulating SPA action there been settled that the document should contain different groups of adaptation actions, including both technical measures (such as the construction of the necessary infrastructure for flood and coastal protection), as well as regulatory change (e.g. changes in the spatial planning system limiting the possibility of building development of areas at risk of flooding and landslides, more flexible procedures for rapid reaction to natural disasters), the implementation of monitoring systems relating to particular sectors and areas and the broad dissemination of knowledge about the necessary changes in economic behaviour.

The following general principles were taken into account:

- susceptibility to risks associated with climate changes, including having regard to this aspect in the planning phase, should be minimized;

- it is necessary to develop plans for rapid reaction in the event of climate disasters (floods, droughts, heat waves), so that public institutions were prepared to provide immediate assistance to victims;
- there should be determined actions that from the point of view of cost-effectiveness should be taken in the first place;
- in the first place, prepare to counter threats to human life and health and damages which effects may be irreversible (e.g., in the form of loosing cultural goods, rare ecosystems.)

2. General Directorate of Environmental Protection held in 2010, a seminar on "Biodiversity and climate change - threats, opportunities, courses of action". The meeting was held within the framework of the implementation of the recommendations of the Standing Committee of the Bern Convention on the impact of climate change on biodiversity.

At the meeting, presentations were on a broad variety of topics. There were discusses the issues of climate change trends, including the caused risks, as well as indications for activities aimed at minimizing the effects of changes.

The theme of the meeting covered the following issues:

1. The forecast directions of climate change
2. The forecast changes in land use

3a. Threats for species and forest complexes

3b. Guidelines for agrocenosis

3c. Guidelines for hydrogenic areas

4. Guidelines for adaptation to climate change policy
5. Droughts, fires and fire protection
6. Vulnerability of ecosystems of Polish maritime areas
7. The vision of network of Polish areas
8. Administration of nature conservation in the face of climate change.

One of the effects of the meeting was mandating a study on the assessment of climate impact on biodiversity. A study: *Assessment of the impact of climate change on biodiversity and the resulting guidelines for administrative action of nature conservation to 2030* was performed in 2012 by the National Fund for Environmental Protection and Water Management.

The main objective of this study was to discuss the impact of climate changes on species and habitats protected in Poland. There were analysed species and habitats under the protection of Convention on the conservation of European Wildlife and natural habitats, and protected habitats and species within the European NATURA 2000 network of sites.

The most important effects of the study:

1. Indication of species and habitats most vulnerable to changes in climatic conditions.
2. Indication of the most vulnerable sites of NATURA 2000.
3. Evaluation of the potential impact on biodiversity of forecast changes in the management and adaptation measures undertaken by man in various sectors of the economy.
4. Identification of key actions for wildlife protection services that allow adapting and mitigating the impact of climate change on nature conservation system in Poland.

3. **General Directorate for Environmental Protection in 2014 launched the project *"Biodiversity conservation through the implementation of land-based network of wildlife corridors on Polish territory."* The aim of the project is to verify the conservation and the functioning status of the 7 major wildlife corridors of international importance within Poland and the network of national corridors designated under the "Implementation of the European Ecological Network in Poland" described in the study: "The project of ecological corridors linking the European NATURA 2000 network in Poland" and then updated in 2011. Moreover, the contractor will verify the above boundaries of the above-specified corridors and prepare the ground for the implementation of land-based network of ecological corridors on Polish territory. One of the main purposes of verifying the network of ecological corridors is to provide a connection between the NATURA 2000 sites to ensure the consistency of the network. The present project is funded by the National Fund for Environmental Protection and Water Management.**

4. **Records of fire prevention in the Forest Management Plans.**

Risks relating to fires are included in the Forest Management Plans. This is an obligation of the Regulation of the Minister of Environment on detailed conditions and procedures for the preparation of forest management plan, a simplified forest management plan and forest inventory. The most important factors to be taken into account in the analysis of the threat of forest fires are:

1. time of the year, and especially retention of snow cover;
2. age and species composition of forest stands and the type of soil cover,
3. intensity of economic activities and method of uses of forests stands,
4. communication routes network and the volume of traffic on the roads,
5. tourism attractiveness and the abundance of forest stocks,
6. distribution of industrial plants and human settlements in forests,
7. other local conditions.

For fire protection of forests in the Forest Divisions, there are included, among others, firebreaks on the lines of the surface division, natural and artificial breaks: roads, water courses with adjacent marshy land, rivers and economic land, belts afforested with deciduous species, natural and artificial water points.

In periods of high fire danger, forest inspectorates may set mobile land fire protection patrols (also with representatives of the fire brigade, State Police and Forest Patrols) who move to areas where is the greatest potential for a fire.

PORTUGAL / PORTUGAL

Portuguese Climate Change Adaptation Strategy

- Goals and measures for the biodiversity sector 2013-2024 -

Portugal approved its National Climate Change Adaptation Strategy (NCCAS) under the Convention on Climate Change in 2010. The NCCAS considers nine strategic sectors. The National Institute for Nature Conservation and Forests coordinates the Biodiversity sector.

The ability to undertake strategic and on-going planning in accordance with possible climate scenarios and together with the increase of knowledge about biodiversity adaptation to climate change will be a factor for successful implementation of the Adaptation Strategy for the sector.

Climate change is considered a major threat to biodiversity in the XXI century. However, the complexity of the climate change process is the main barrier to the definition and prioritization of adaptation measures in a short-medium term. On the other hand, biodiversity conservation is a multifaceted and cross-cutting issue, still not mature enough to be naturally assumed and integrated in decision-making processes and practices.

For the implementation of the NCCAS, the biodiversity sector adopted a preventive and precautionary approach structured in order to ensure consistency and applicability of the adaptation measures. The proposed measures aim to minimize the direct and indirect losses of species and habitats, the maintenance of ecosystem services and the strengthening of mechanisms that might ensure the identification and timely response to changes in biodiversity due to climate change.

In the definition of adaptation measures for the biodiversity sector we started with a bibliographic exploration and a consultation to researchers involved in projects or activities with relevance to the subject. For amphibians and reptiles it was also used the methodology of calculation of vulnerabilities by species described by Harley (2011), and all information obtained was discussed with a number of specialists.

The following textbox shows a short version of the biodiversity adaptation to climate change objectives and measures.

STRATEGIC OBJECTIVE 1. INFORMATION AND KNOWLEDGE.

Identify and anticipate vulnerabilities and impacts from climate change across sectors, and improve methodologies for the identification of adaptation measures, analysis of its feasibility and evaluation of costs and benefits.

Specific Objective 1.1 To increase knowledge about the effects and forms of adaptation of species and habitats, and of the structure and function of ecosystems to climate change.

Strengthen long term scientific research, with experimental development on effects of climate change on species and habitats.

Develop predictive models based on current or historical distribution of species and communities, and their responses to climate change, given the projections of regional climate models (MMA, 2006). Bioclimatic models should be applied at least to the habitat types and the most vulnerable species listed in Annexes I and II of the Habitats Directive and Annexes I, II, III and IV of the Birds Directive; a second phase should be applied to other species with protected status, in particular those included in Annexes I, II and III of the Bern Convention. Regarding ecosystems, one of the relevant areas is knowledge and anticipating potential changes in the natural succession processes due to climate change (Secretariat of the CBD, 2009).

Measure 1.1.1. Develop national plans for long-term research on the effects and ways to adapt to freshwater FISH.

Measure 1.1.2. Develop national plans for long-term research on the effects and ways to adapt to the species of REPTILES AMPHIBIANS and more vulnerable.

Measure 1.1.3. Develop national plans for long-term research on the effects and ways to adapt Steppe Birds.

Measure 1.1.4. Develop national plans for long-term research on the effects and ways to adapt BATS.

Measure 1.1.5. Develop integrated studies on biodiversity adaptation to climate at the level of community, ecosystem and landscape changes.

Measure 1.1.6. Develop models to examine the effects of climate change on biodiversity based on more detailed and consistent regional climate change scenarios.

Measure 1.1.7. Identify further needs for research on the effects and forms of adaptation of climate change in the context of biodiversity and establish appropriate levels of investigation.

Measure 1.1.8. Revise statutes of threatened species based on criteria defined by IUCN.

Specific Objective 1.2 To create programs for monitoring and controlling the effects of climate change at level species, habitats and ecosystems level.

Implement biodiversity monitoring programs to support planning and adaptive management in the appropriate time scale and its effects on species, habitats and ecosystems. Consolidate and integrate data from monitoring networks in the long term to detect the effects of climate change, such as the monitoring water quality network associated with the Water Framework Directive and the National Monitoring Programme Wintering Waterfowl.

Measure 1.2.1. Create terrestrial and aquatic biodiversity monitoring programs at a national and regional scale.

Measure 1.2.2. Create plans for monitoring and controlling unpredictable risk situations, such as fires, floods, droughts and heat waves.

Measure 1.2.3. Integrate data from observation, monitoring and follow-up in a database.

STRATEGIC OBJECTIVE 2. REDUCE BIODIVERSITY VULNERABILITY AND INCREASE CLIMATE RESPONSE.

It is expected that conservation and management measures that maintain or regain natural biodiversity favour adaptation to climate change. However, also measures to increase the adaptive capacity of species and ecosystems in the face of a possible rapid pace of climate change should be considered.

Specific Objective 2.1 To reduce the vulnerability of species, habitats and ecosystems to climate change.

The effects of climate change could be reduced by creating a green infrastructure favourable to the active or passive movement of target populations.

Indirectly, the effects of climate change could be mitigated by promoting the conservation of species and habitats and genetic diversity of ecosystems in more varied landscapes. At the same time, the effective control of other existing pressures with negative cumulative effects on most vulnerable species, habitats or ecosystems should be increased.

Alongside this approach, or possibly in some cases necessarily simultaneously, is to consider the recovery of ecosystems. The ecosystem restoration involves activities that transform a degraded ecosystem in a more resilient system and able to provide services. One approach for maintaining the functions of the different ecosystems in climate change scenarios will be allowing natural processes to deem appropriate temporal and spatial scales of ecological adaptation to the new abiotic parameters.

Measure 2.1.1. Ensure a diverse landscape that supports a network of green corridors.

Measure 2.1.2. Maintain the functions and services of ecosystems more vulnerable to climate change.

Measure 2.1.3. Actively manage species and habitats to adapt to the effects of climate change (in situ and ex situ).

Measure 2.1.4. Reduce other anthropogenic pressures on biodiversity.

Specific Objective 2.2 To integrate biodiversity and climate change in the various sectorial policies, plans and programs, including land planning at regional and local level and projects.

The reduction of the effects of climate change on biodiversity is only effective to ensure the existence of procedures inclusive of biodiversity and ecosystem services in other sectors, in order to address different scenarios of climate change in planning and integrated management of biodiversity.

The environmental assessment of plans and programs and the environmental impact assessment instruments are also suitable climate validation plans, programs and projects and it is necessary to strengthen the monitoring component of plans and projects a perspective of adaptive management.

Measure 2.2.1. Increase the use of Strategic Environmental Assessment (SEA) of plans and programs and Environmental Impact Assessment (EIA) of projects as decision-making tools.

Measure 2.2.2. Analyse national reference documents for biodiversity in accordance with criteria of climate validation.

Measure 2.2.3 Reviewing sectorial policies, plans and associated legislation and ensure its climate validation in terms of biodiversity.

Measure 2.2.4. Reviewing the Basic Network of Nature Conservation in the face of climate change issues.

Measure 2.2.5. Develop action plans for vulnerable species and habitats.

Measure 2.2.6. Develop management plans for Hazardous Areas.

STRATEGIC OBJECTIVE 3. PARTICIPATION AND AWARENESS.

Promote and ensure a high level of involvement and public participation in the formulation and implementation of strategy. Acquaint the citizens, businesses and other social actors the main expected impacts, as well as disseminating good practices sectorial adaptation.

Specific Objective 3.1 To empower public and private actors involved in climate change decision making.

Those in charge of decision-making from the point of view of climate and biodiversity must be well informed in order to deal with different decision stages including links with different sectors.

Measure 3.1.1. Make available to society and decision makers the updated scientific knowledge on biodiversity adaptation to climate change.

Measure 3.1.2. Promote training actions on the recovery of the most vulnerable species and habitats.

Specific Objective 3.2. To raise awareness and involve a wide range of stakeholders in biodiversity adaptation to climate change.

The participation of all stakeholders and the general public in decision-making on the environment is a key to the successful implementation of policies, plans, programs and projects.

It is intended to encourage informed participation, enlarged, and adapted to the different publics potentially interested in implementing measures for biodiversity adaptation to climate change.

Measure 3.2.1. Implement an awareness program on climate change and biodiversity.

Measure 3.2.2. Mobilize and encourage the active participation of stakeholders in the discussion and proposal of measures for biodiversity adaptation to climate change.

STRATEGIC OBJECTIVE 4. COOPERATE INTERNATIONALLY.

Follow the international agreements on climate change adaptation. Coordinate the implementation of actions to biodiversity adaptation to climate change at the international level.

Specific Objective 4.1 To cooperate with developing countries.

Promote the exchange of experiences in the implementation of measures to biodiversity adaptation to climate change within the framework of the Community of Portuguese Language Countries (CPLP).

Measure 4.1.1. Improve circulation and dissemination of information on biodiversity adaptation to climate change with CPLP countries.

Measure 4.1.2. Promote training actions on climate change contributing to the recovery of the most vulnerable species and habitats within the CPLP.

Specific Objective 4.2 Cooperate in the European and the UN context.

Ensure coordination of measures of biodiversity adaptation to climate change within the framework of international agreements and conventions and establish protocols or partnerships internationally.

Measure 4.2.1. Improve circulation and ways to disseminate information on biodiversity adaptation to climate change with bodies of the European Union and the European Council.

Measure 4.2.2. Integrate the guidelines for biodiversity adaptation to climate change proceeding from the EU and multilateral level.

Measure 4.2.3. Propose a revision of the statutes for the protection of species and habitats.

Measure 4.2.4. Develop and participate in cooperation projects in the Iberian and Mediterranean context.

In the period 2013-2014, one of the challenges will be to integrate the European Strategy for Adaptation to Climate Change in the sectorial proposals. In this second phase of implementation of the NCCAS it is also projected to strengthen a basis for decision support in the medium to long term which should encourage coordination between the different sectors and facilitate the access to funding sources.

In the short-medium term, biodiversity adaptation to climate change will focus on no and low regrets measures with positive externalities for other sectors, including:

- the development of models for analysing the effects of climate change on biodiversity based on more detailed and consistent regional scenarios
- the development of biodiversity monitoring programs under risk or extreme situations, such as fires, floods, droughts and heat waves
- the management of vulnerable species and habitats to adapt to the effects of climate change
- the active participation of stakeholders in biodiversity adaptation to climate change.

SLOVAK REPUBLIC / REPUBLIQUE SLOVAQUE

MINISTERSTVO ŽIVOTNÉHO PROSTREDIA SLOVENSKEJ REPUBLIKY

Bern Convention
national report on implementation of the Recommendation No 159/2012 on the effective implementation of guidance for Parties on biodiversity and climate change in the Slovak Republic

Bratislava, June 2014

Prepared by Ms Anna Kružicová, Ms Jana Durkošová (Ministry of the Environment of the Slovak Republic) and Ms Michaela Mrázová, Mr Libor Ulrych (State Nature Conservancy of Slovak Republic)

Introduction:

Our report provides the general overview on implementation of the Recommendation No 159/2014 at the national level (not the precise replies to each of 9 items of the Recommendation).

Summary:

Connection of the biodiversity and the climate change is the complex issue considered by competent institutions and several activities and projects have been implemented such as the LIFE project Revitalization of climate in dry areas in the Eastern Slovakia via the water-climatic restoration. In Slovakia there are several tools to support the resilience of biodiversity (protected species, protected areas – for which management plans are to be developed) as well as territorial system of ecological stability (concept of ecological network of biocentres, biocorridors and of interaction elements at national, regional and local levels, part of the nature protection documentations to be considered in territorial planning).

In 2014 Government of the Slovak Republic approved several crucial documents that created the bases for the coordinated action and for the financing of needed activities. They are namely:

1. Adaptation Strategy of the SR on Adverse Impacts of Climate Change (decision of the government No 148/2014);
2. Updated national strategy on biodiversity protection by 2020 (decision of the government No 12/2014);
3. Operational program "Quality of the Environment" of the Slovak Republic 2014-2020 (decision of the government No 175/2014) and other programs to use the EU funds.

Reflection of biodiversity/climate change in the actual national documents:

1. **National Adaptation Strategy**[1] is the complex cross-sector document based on integrated approach. It tackles the issue of biodiversity with respect to adverse impacts of the climate change as well as the adaptation of species and ecosystems against these negative impacts. Adaptation based on ecosystems (integrating biodiversity and ecosystem services into global adaptation strategies) generates (apart for the biodiversity support) social, economic and culture benefits, too. Based on analysis of the climate change impacts on species and ecosystems the following adaptation measures have been suggested:

[1] Item 5 of the Recommendation

Impact of the climate change	***Proposed adaptation measures***	***tools***	***synergies***
Change of the favourable status of forest habitats, fragmentation of forest, fires, increase of damages, of drought and floods	*Strenghtening of the natural regeneration of natural forests and their sustainable use*	*Forest-environment measures, Natura 2000; forest ameliorations and measures to keep water in the landscape*	*Keeping of nutrients, stabilization of flows; prevention of land-slides; limitation of risks of calamities and fires; recreation and tourism; carbon sequestration;*
Drought and floods, changes of water regime and of water sources quality; increase o f air temperature	*Restoration of the degraded wetlands (peatlands, changes water regime, prevention to succession) and of inundation areas, enabling of the natural water stream dynamic, elimination of not used forest roads*	*Agro-environmental schemes, forest ameliorations and other measures to keep water in landscape, EU water framework directive, Natura 2000, Ramsar Convention, territorial planning*	*Keeping of nutrients, stabilization of flows; prevention of floods and storm rainfall; increase of resistance and resilience to the climate change; restoration of habitats and of populations of endangered and of migratory species; carbon sequestration; cooling of the environment*
	Creation of wetlands (water areas, increasing of the inundation anre retention capacity of upper and medium water streams, restoration of river meanders in upper parts)	*Watershed plans, Natura 2000, Ramsar Convention, forest ameliorations and other meearues to keep water in landscape; territorial planning*	*Minimalization of large gaps in ecological network; increase of resistence and resilience to the climate change; flood protection, keeping water in landscape, ensuring of water quantity; increase of biodiversity; cooling of the environment*
Increased erosion, change of temperature conditions for plant production and of agro-climate production potential, changes of fyzical and chemical properties of soil	*Diversification of landscape and of landscape structures – ensuring of heterogenic ecosystems, increased diversity of vegetation and of morfology, ensuring of dynamic natural processes*	*Territorial planning, forest ameliorations and other measures to keep water in the landscape*	*Diversification of agriculture production; biodiversity protection in agricultural land; carbon sequestration in biomass*
	Sustainable use of grasslands	*Agro-environmental measures, Natura 2000*	*Flood protection, keeping of nutrients; stabilization of soil structure; protection of various habitats; carbon sequestration in soil*
Habitat fragmentation	*Increase of the landscape connectivity – building of green infrastructure, support or creation of coridors and stepping stones, elimination of barrier effects of roads and railways, elimination of barier on water streams*	*Territorial planning, territorial system of ecological stability, EU water framework directive, agro-environmental measures*	*Development of ecological networks; ensuring of mobility and space connection of habitats; defragmentation of infrastructure among protected areas*
Spread of invasive allien species and patogens	*control/eradication of invasive and expanding allien species*	*Natura 2000, act on nature and landscape protection and relevant strategies, programs in agricultural sector*	*Decrease of alergens, healts status of inhabitants; biodiversity protection (natural ecosystems)*
	Systematic, long-term mapping, monitoring of occurrence of populations of invasive species		

The Strategy[2] is based (among others) on principles to increase knowledge base and to provide objective information on impacts of climate change/adaption. This is important not only for the public but also decision-making bodies at all levels. NGOs play an important role in this field. The official internet portal on the issue is under construction in order to enable access to all the documents at the national and international sources.

During the Strategy preparation a specific coordination mechanism[3] was created to exchange information and to monitor adaptation processes at the horizontal and vertical level. This working group also included representatives of the Division of Nature and Landscape Protection of the Ministry and of the State Nature Conservancy of the Slovak Republic. It represents a good example of cooperation among experts (including issues of biodiversity aspects).

2. **Updated national strategy on biodiversity protection by 2020 i**ncludes 9 aims, further divided to measures. The most relevant are

- B.3.4 develop strategic framework to set priorities on restoring ecosystems and to prepare and implement program of revitalization of wetlands and of river ecosystems and to contribute into elimination to the climate change)
- B.3.6 ensure positive impact of the Adaptation Strategy of the SR on Adverse Impacts of Climate Change on biodiversity via measures based on ecosystems

An Action plan to implement measures of the Updated national strategy on biodiversity protection by 2020 has been completed (currently subject to an approval at the level of the Ministry and further submitted for external consultations among sectors and public) includes several draft action both specifically on the mitigation of climate change impacts and on support to protected habitats, protected areas and restoration of ecosystems including wetlands.

3. **Operational program "Quality of the Environment"** of the Slovak Republic 2014-2020 and other programs to use the EU funds will form the main financial tools to implement approved strategies in practice. Several of them include mitigation of the climate change and adaptation measures (including those based on ecosystems). They are mainly the Rural Development Plan Slovak Republic 2014-2020, the operational program Quality of the Environment of the Slovak Republic 2014-2020 as well as operational programs of cross-border and transnational cooperation. They are in various phase of preparation/approval. Operational program "Quality of the Environment of the Slovak Republic 2014-2020" has been submitted to the approval of the European Commission. Its draft approved by the government includes the specific investment priority:

- "support investments in adaptation of climate change impacts including ecosystem approaches" - proposed specific aims include adaptation measures based on water accumulation, various water management measures as well as in agricultural land, forest and urban areas.
- "protection and renewal of biodiversity and soil and support of ecosystem service including via Natura 2000 network and green infrastructure" proposed aims include actions for protected areas, mapping and assessment of ecosystems, restoration of degraded ecosystems and development of green infrastructure.

[2] Item 6 of the Recommendation

[3] Item 9 of the Recommendation

SPAIN / ESPAGNE

SPAIN REPORT

CLIMATE CHANGE: PROGRESS IN THE IMPLEMENTATION OF THE MEASURES IDENTIFIED IN RECOMMENDATION NO. 159 (2012) ON THE EFFECTIVE IMPLEMENTATION OF GUIDANCE FOR PARTIES ON BIODIVERSITY AND CLIMATE CHANGE.

The Climate Change Adaptation National Plan (PNACC), which fulfills the compromise acquired by Spain as a Party of the UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, in which article 4.1b, states that all Parties to the Convention shall "formulate, implement, publish and regularly update national programs containing measures to facilitate adequate adaptation to climate change", was adopted in July 2006 providing the current framework for carrying out assessment actions to evaluate impacts, vulnerability and adaptation to climate change in Spain.

The Plan is being implemented through work programs, in which, among others, biodiversity is been tackled as a priority sector for the action. Until now some evaluation, analysis, and participation activities related to this aspect had been carried out, but more actions are to be done in this framework.

The PNACC's main objective is to mainstream adaptation to climate change in the planning processes of all the relevant sectors or systems.

Regarding biodiversity, on the 16th of September, 2011, the Council of Ministers approved the **Strategic Plan for Natural Heritage and Biodiversity,** main planning instrument for conservation and sustainable use of biodiversity, which integrates the main lines of action of the PNACC. The Strategic Plan includes multiple references to the PNACC which can be considered as a good example of mainstreaming adaptation to climate change into sectoral policy.

The Plan, developed by the Ministry of Environment, Rural and Marine Affaires, nowadays, Ministry of Agriculture, Food and Environment, includes actions to promote mainstreaming of biodiversity into sectoral legislation.

The PNACC describes the following lines of action in biodiversity:

- Mapping the vulnerability of Spanish biodiversity.
- Consolidation of ecological monitoring networks.
- Development of a system of biological indicators for impact assessment.
- Assessment of the protected areas -including the Natura 2000 Network – under different climate change scenarios.
- Evaluation of the potential of ex-situ conservation measures.
- Assessment of the impacts on ecosystems goods and services

Regarding these lines of action, the Ministry of Agriculture, Food and Environment has developed different projects under the PNACC framework, described in formers reports (2010, 2011).

In the last years work under the PNACC framework has continued, and among others, the following projects have been published:

1. Impacts, vulnerability and adaptation to climate change of the forest sector.

2. Assessment of exotic alien species to the impacts of climate change.

3. Assessment of the vulnerability of domestic tourism to the impacts of climate change impact.

All of them can be downloaded in the Ministry website: http://www.magrama.gob.es/es/cambio-climatico/publicaciones/publicaciones

Also, different actions had been developed under the Strategic Plan for Natural Heritage and Biodiversity, which underpins the need to ensure coherence between climate change and biodiversity conservation policies, encouraging positives synergies between them and avoiding possible effects.

The need to adapt to climate change is considered as a general framework in the development and application of the Strategic Plan.

The Strategic Plan includes four actions under the Objective *"Enhance the coherence and positives synergies between biodiversity conservation and climate change policies"*, developed collaboratively between the General Directorate of Climate Change and the General Directorate of Natural affairs.

These actions are:

- Establishment of coordination mechanisms to assure mutually consistent between planning instruments and actions derived from biodiversity conservation and climate change policies.
- Promote that conservation actions and sustainable use of biodiversity contribute actively to mitigation and adaptation to climate change.

No specific coordination mechanisms has been developed yet but the collaborative work between the General Directorate of Climate Change, the General Directorate of Natural Affairs and the General Directorate of Forest Policy has had very positive results, as the fact that adaptation has been integrated in the Strategic Plan for Natural Heritage and Biodiversity.

- Assure that mitigation and climate change adaptation actions take properly into account the biodiversity conservation requirements.

This consideration is tried to be ensured at a legislative level, so climate change impacts are taken into account in all the plans/strategies and other instruments in which adaptation is integrated.

- Use of regionalized climate change scenarios of the Climate Change Adaptation National Plan to carry out the analysis of the effects of climate change over biodiversity.

The project, *"Climate change and biodiversity in Spain: Impacts, vulnerability and adaptation"* described in formers reports is the main result of this action under the Strategic Plan for Natural Heritage and Biodiversity, which main results are:

- Atlas of Climate Change impacts over the Spanish Iberia fauna. (http://www.ibiochange.mncn.csic.es/atlascc/?page_id=39)
- Atlas of impacts and vulnerability of climate change over flora and main land habitats of the Spanish peninsula. The publication can be watched under (http://www.magrama.gob.es/es/biodiversidad/temas/inventarios-nacionales/lib_imp_cc_flora_tcm7-176082.pdf
- Wiki: web page (http://secad.unex.es/wiki/libroOECC/) where all the information regarding the project is localized. It includes links to the different reports, data and models, ect.
- Informatics application for consultation and analysis.

SWEDEN / SUEDE

SWEDISH ENVIRONMENTAL PROTECTION AGENCY

David Schönberg Alm
Phone: +46-106981688
david.schonberg.alm@swedishepa.se

Report
2014-10-22

Case number:
NV-06211-14

Report on the implementation of Bern Convention Recommendation 159 (2012) on the effective implementation of guidance for Parties on biodiversity and climate change.

Background

The Bern Convention Bureau has decided to include the issue of how the Contracting Parties addresses the issue of negative effects on biodiversity due to climate change on the upcoming Standing Committee meeting. For that reason the Bureau has asked for a report on the implementation of the Convention Recommendation 159 (2012).

The Swedish Environmental Protection Agency hereby submits the Swedish report.

The Government bill on biodiversity and ecosystem services

The strategy outlines a roadmap towards halting the loss of biodiversity and ecosystem services, in accordance with the goals expressed in the Aichi biodiversity Targets and the EU 2020 biodiversity Strategy, as well as the National Biodiversity Strategies and Action Plans (i.e. NBSAP). In the strategy, the Government puts emphasize on the adverse effects of climate change on biodiversity, and addresses the overarching ambition to minimize C02-emissions through active nature conservation politics. The strategy formulates the ambition to develop methods to reduce C02-emissions due to land use, as well as methods for increasing the carbon sink.

Further, the strategy proposes measures for adapting land use to a changing climate, including for example:

- An overview of the instructions to relevant authorities, in order to better formulate responsibilities and tasks regarding adaptation to a changing climate.
- An overview of the basis for spatial planning provided by the County Administrative Boards to the municipalities, specifically concerning risks following climate change.
- Investigating legislative hindrances concerning adaptation to climate change.

OFFICE: STOCKHOLM -VALHALLAVÄGEN 195
ÖSTERSUND – FORSKARENS VÄG 5, HUS UB
POSTAL ADDRESS: SE-106 48 STOCKHOLM
PHONE: 010-698 10 00
FAX: 010-698 10 99
E-MAIL: REGISTRATOR@SWEDISHEPA.SE
INTERNET: WWW.SWEDISHEPA.SE

Green infrastructure

In order to maintain biodiversity and ability to supply ecosystem services in a changing climate, it is necessary to develop green infrastructure – key biotopes and dispersal corridors - to connect protected areas. Networks of protected areas, such as N2000, and developing green infrastructure are important measures formulated in the Biodiversity Action Plan set up to reach the 2010-target (CBD). Sweden endorses both the BAP as well as the 2010-target, and is a driving force in the development of effective targets – on a global as well as regional level.

- On the national level, several of the 16 National Environmental Objectives in some way include biodiversity, and address climate change in relation to this. The most pressing issue regarding fulfillment of the Objectives is not considered to be primarily due to climate change but rather other anthropogenic activities such as land use. However, those Objectives that encompass biodiversity are more in danger of not being fulfilled, due to climate change. In light of this, it comes down to how well the goals set up in the Objective #1 *Reduced Climate Impact* are met.

Measures taken (a few examples)

- By and large, the measures taken so far have been focused on the distribution of knowledge and information. For example, The Swedish Meteorological Institute has been appointed to establish a national knowledge center for adaptation to climate change. The Institute shall collect, analyze and distribute information, as well as developing guidelines for climate change scenarios.
- The National Veterinary Institute has analyzed possible impacts on animal and human health due to climate change, focusing on known and new diseases. The Institute lists possible changes that might affect vectors, such as:
  - Geographic distribution
  - Fragmentation of habitats
  - Increased replication frequency

The Institute, together with other relevant authorities, have taken joint actions to establish a knowledge base, as well as suggesting actions to minimize risks of diseases spreading.

- Climate change is included in the process when planning designation of protected areas as well as developing new/updating National Species Action Plans.

This document has been signed electronically and registered in our case management system.

Mark Marissink

David Schönberg Alm

c.c.

Marie Dahlström, Miljödepartementet

SWITZERLAND / SUISSE

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of the Environment,
Transport, Energy and Communications DETEC

Federal Office for the Environment FOEN
Species, Ecosystems, Landscapes Division

http://www.bafu.admin.ch

BIODIVERSITY AND CLIMATE CHANGE – REPORT OF SWITZERLAND

The Federal Council's strategy "Adaptation to climate change in Switzerland – Goals, challenges and fields of action"[4] was published in 2012. Since then, the action plan to the strategy has been elaborated and adopted by the Swiss Federal Council on 9 April 2014[5]. The action plan takes up the targets from the strategies first part and outlines the ways on how to achieve these targets by 2050, emphasizing a first set of measures for the period 2014-19. A total of 63 measures have been elaborated covering the sectors most affected by climate change. These sectors encompass water management, natural hazards prevention, forestry, agriculture, energy, biodiversity management, health, tourism and spatial planning. The measures dealing with the biodiversity sector address issues across all levels from genes to ecosystems and aim at:

- improving the adaptability, evaluating the risks, establishing scope of action
- preserving and improving habitats threatened by climate change
- promoting biodiversity in urban areas
- minimising adverse impacts of the implementation of adaptation measures by other sectors

The measures outlined in the action plan of the adaptation strategy focus on the additional needs for action due to enhanced climate change, whereas the action plan of the Swiss Biodiversity Strategy[6] cover the needs for action under present conditions. The latter is due in early 2015.

Apart from these activities dealing with national strategies, a report on "Climate change in Switzerland – Indicators of driving forces, impact and response"[7] has been published in 2013. This report presents a brief outline of the multiple interactions between the climate and the natural and anthropogenic environments. It presents numerous indicators that illustrate the changes in the climate in Switzerland, whether in the cryosphere, the hydrosphere, biodiversity, human health, the economy or the society. In early 2014, Switzerland published its report to the UN convention on climate change and reviewed its climate policy at the national level[8]. In April 2014 the fifth national report to the CBD was also published[9].

Within EPA (European Network of Heads of the Environment Protection Agencies) and ENCA (European Network of Heads of Nature Conservation Agencies) representatives of the Swiss Federal Office for the Environment (FOEN) actively participate at various working groups such as a.o. the ENCA Climate Change Adaptation Working Group[10] dealing with ecosystem based adaptation to climate change.

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[4] http://www.bafu.admin.ch/publikationen/publikation/01673/index.html?lang=en
[5] http://www.bafu.admin.ch/publikationen/publikation/01762/index.html?lang=de (so far available in F, D, I, only)
[6] http://www.bafu.admin.ch/publikationen/publikation/01660/index.html?lang=en
[7] http://www.bafu.admin.ch/publikationen/publikation/01709/index.html?lang=en
[8] http://www.bafu.admin.ch/publikationen/publikation/01757/index.html?lang=en
[9] http://www.sib.admin.ch/fileadmin/chm-dateien/dokumentation/Publikationen_2014/Switzerland_5th_National_Report.pdf
[10] http://www.encanetwork.eu/interest-groups/climate-change-adaptation

TURKEY / TURQUIE

REPUBLIC OF TURKEY

MINISTRY OF FORESTRY AND WATER AFFAIRS

Government Report for the Meeting of Group of Experts on Biodiversity and Climate Change

Turkey has several institutions and a lot of non-governmental organizations who are responsible for monitoring of biodiversity and fight with climate change. Thus, one of the most important areas studied within this respect is protection of biodiversity. Some of the projects related with conservation of biodiversity is given below:

Inventory and Monitoring of National Biodiversity Project: A new project has been started in 2013, which aims to determine the population levels for most of the species occuring in Turkey. This "Inventory and Monitoring of National Biodiversity Project", includes detection at the species level, population level, habitat and ecosystem level.

Awareness raising in stakeholder groups and preparation of a guideline for the integration of nature conservation into economical systems: This project was conducted in 2012 and it investigated the socio-economical dimensions of nature conservation, as a result, a know-how about how to intergrate nature conservation policy into economical and social policies has been produced.

Moreover, a new division in the General Directorate of Nature Conservation and National Parks was founded. This new division is responsible for adaptation of nature conservation policy with different sectors. Its main duties are improving green economy for sustainable development. This division held a panel discussion about Biodiversity Economy in 2012. In this meeting, with the contribution of senior administrators from all the related ministries, scientists and representatives of the business world, the methods on how to develop new strategies for biodiversity economy in a sustainable manner were discussed.

Besides, Climate Change Action Plan for Turkey has been prepared with the support of UNDP and published in 2012. According to this plan, Turkey has integrated its Climate Change policies with its sustainable development strategies which includes encouraging utilization of renewable energy sources, and thus to provide its citizens an environment with a lower level of carbondioxide and other pollutants. In this action plan, sectoral approach to mitigate the effects of climate change has been internalized.

A new program has been started to take care of endangered species in Turkey. 3 seperate workshops were held with the contribution of scientists from universities all around Turkey, NGOs and related institutions. Endangered species were prioritized by their critical condition and a timetable was prepared including a 10 year time interval to list the most critical species in Turkey. At the end of the workshops, a document titled Turkey's Species Conservation Strategy was published.

Several projects were conducted related with protected areas and climate change. Some of them are mentioned below:

Wetlands and Climate Change Project: In 2009, a project titled "Mitigating the Effects of Climate Change and Conservation and Sustainable Use of Turkey's wetlands within the scope of protection of biodiversity" has been launched. This project's duration was 46 months and it has ended in April 2013. The project targeted to protect wetlands of Turkey with their ecological and sociological functions, for the welfare of future generations. Its pilot implementation areas were Yenicaga Lake in Bolu and Akgol in Konya. With this project;

For the first time, carbon absorbtion capacity and the amount of peat of a wetland has been determined,

A wetland (Akgol) has been restored with the coordination of General Directorate of Nature Conservation and National Parks,

2300 primary school students have been educated on wetlands and impacts of climate change.,

Technical knowledge of Ministrial staff on peatlands and wetland restoration has been increased,

To raise public awareness about impact of climate change on wetlands, 2 website have been established, 2 documentary movies have been filmed and 2 books about wetlands have been published.

This project has also made contributions to future partnerships among GDNCNP and related institutions. Thus we expect monitoring studies to be increaed by number with cooperative studies.

After this project, in 2012, wetland management plan for Akyatan-Tuzla Lagoons was approved. For the first time with this project, the effects of climate change were started to be monitored.

Project on Improving the Management of Forest Protected Areas

This project, which was carried out by Ministry of Forestry and Water Affairs together with UNDP and WWF-Turkey was a multi-scope project, and in one of its stages, a workshop was held in order to prepare a strategy document for Protected Areas and Climate Change. The most important priorities in this document was also included in the Climate Change Action Plan for Turkey.

As regards with the management of protected areas, Turkey has a great deal of types of protected areas, which covers approximately the 10% of the terrestrial areas. The most contradictory situation about the management of these areas was that, since they were established according to different laws, their management strategies were different. However, with the new work done on the management of these areas, a common methodology has been developed which is applicable to all types of protected areas under the responsibility of Ministry of Forestry and Water Affairs.

This methodology included the joint studies with universities and NGOs to be able to prepare more realistic and applicable management plans. These management plans are prepared in a manner that takes into account adaptive management strategies. Besides, for the integration of protected area management plans into broader plans like Environmental Plans, cooperative studies are being conducted with Ministry of Environment and Urbanization.

New protected areas were established to improve the network of protected areas. These protected areas provide protection and sustainability of different ecosystems like forest, mountain, step, lake, marine etc.

UKRAINE / UKRAINE

Expert group meeting on biodiversity and climate change

Strasbourg, 19 June 2014

On implementation of the Recommendation No. 159 (2012) of the Standing Committee on the effective implementation of guidance for Parties on biodiversity and climate change it should be informed the following.

The territory of Ukraine is not the most vulnerable to global climate changes. However, climate change is a real threat in Ukraine. The trends that emerged over the past decades were observed in the reporting period. According to the repot of National Academy of Sciences of Ukraine, the last decade in the country it was witnessed significantly increased temperatures. There are in Ukraine too obvious interconnections between climate change and biodiversity. The trend is most evident in much of the southern regions within steppe zone.

Climate change mitigation and adaptation policies

National policy documents make commitments to biodiversity conservation, development of an ecological network and climate changes. Ukraine consistently contributes to measures for mitigating global climate change. Being Party to the UN Framework Convention on Climate Change and the Kyoto Protocol Ukraine fulfills its commitments to reduce greenhouse gas emissions. Being Party the Kyoto Protocol Ukraine takes an active part in reducing greenhouse gases through “flexible mechanisms” - Joint Implementation and Emission Trading in the framework of Green Investment Scheme.

The Low of Ukraine “On the Basic Principles (strategy) of the State Environmental Policy of Ukraine till 2020” (2010) and National Action Plan on Environmental Protection for 2011-2015 provides legal basis for development and phased implementation of National action plan for mitigation climate and prevent anthropogenic climate change until 2030.

In the frame of the state policy in the field of adaptation to climate change, it fulfilled a number of research projects, including:

- elaboration of climate change scenarios in Ukraine in the medium and long-term scenarios with using global and regional models;
- preparation of detailed maps with using geographic information systems on future climate conditions in Ukraine under different scenarios of climate change;
- carrying out spatial analysis of trends in the frequency and intensity of extreme meteorological events in Ukraine as a result of climate change;
- conducting spatial assess for the extent of future climate favorable conditions for basic crops and forest plantations;
- carrying out spatial analysis of changes of water regime badins of surface water bodies in Ukraine due to climate change;
- elaboration of guidelines on risk assessment for human health of the environment, economic sectors due to the increased number and intensity of extreme meteorological phenomena due to climate change;
- development of guidelines for central and local authorities to identify adaptation measures to climate change.

With the purpose to connect two global issues of biodiversity and climate change in the years 2013-2014 there were taken such measures.

It was created new national park "Male Polessye" and expanded the area of the national park "Holosiyivsky" that cover about 14 thousand hectares. There were also established new protected areas on local level. In total, the system of protected areas in Ukraine covers 3.7 million hectares of land within the territory of Ukraine and 430 thousand hectares within the Black Sea.

In 2013 the Ukrainian-Belarussian-Polish Coordinating Council of Transboundary Biosphere Reserve "West Polessye" was established. The first meeting of the Council was held to develop a joint action plan for the management of biosphere reserve.

In previous years government of Ukraine adopted three orders to designate 19 Potential Ramsar sites with total area of 59 thousand hectares. Work with the Secretariat of the Ramsar Convention is ongoing in order to assign them the status of wetlands of international importance.

During reporting period in Ukraine some projects were implemented concerning issues of biodiversity and climate change.

The Project **"Integrating Climate Change into Vulnerable Ecosystems Management: natural parks in wetlands and forest areas (Ukraine)"** was implemented in vulnerable ecosystems (wetlands, swampy areas, wet forests) in the northern part of Ukraine (so called Polissya Region) by Association VERSeau Développement, France; Ukrainian Society for the Protection of Birds, Pyrenees National Park, France; National Park "Pripyat-Stokhid" and Polissya Nature Reserve, Ukraine.

Overall objective of the project was to promote environmental and social-economic sustainability of vulnerable eco-systems confronted with climate change impacts in Polissya Region.

The area of project implementation covered two protected areas:

National Nature Park "Pripyat-Stokhid". Its name is aptly characterizes this park - river a hundred leaves": feature of these rivers is the presence of dozens of channels, backwaters, oxbows, including many wetlands and sandy islands, which are home to many species of plants and animals.

Nature Reserve "Polissky" - one of the oldest nature reserves in Ukraine. Its main treasure is vast swamps and forests, board and sand dunes, cranberry, forest fauna and rare endemic plants.

Main results:

Local Climate Adaptation Plans (LCAP) for protected areas where developed and implemented in the pilot basis.

One of the key outcomes of the project is the practical benefit in positive change in the stability of ecosystems through the implementation of pilot projects on the practical implementation of specific measures described in terms of adaptation to climate change.

The Project also was planned and implemented measures to improve living conditions and reduce poverty in local communities.

Technology and know-how to strengthen resilience of vulnerable ecosystems are transferred between Ukrainian and French nature parks.

Practical implementation of Local Climate Adaptation Plans supported biodiversity conservation and therefore support fulfillment by Ukraine its obligations under Ramsar and Bern Conventions as well as to reduction of CO2 emissions due to peatland renaturalization in Polissya region.

Public awareness to mitigate and adapt to climate change.

EU project "Enhanced Economic & Legal Tools for Steppe Biodiversity Conservation and Climate Change Adaptation and Mitigation ("Steppe Biodiversity")"

The Steppe Biodiversity project was funded by the European Commission in the framework of "Thematic programme for Environment and sustainable management of natural resources, including energy". The project implemented by the Ukrainian Society for the Protection of Birds in association with Institute for Community Development – Ukraine; Rural Development Centre – Ukraine; Mott MacDonald – The Netherlands; European Centre for Nature Conservation – The Netherlands.

The overall objective of this project was to contribute to:

- restoring depleted or abandoned Steppe lands, in a environmental and economically sustainable manner,

- maintaining and enhancing Steppe biodiversity through careful land management and, where appropriated, nature protection - through the establishment of protected areas,
- supporting sustainable rural economic development,
- supporting Global CO2 emission reduction, thus mitigating the impact of climate change, through carbon sequestration in depleted soil and bio-mass, and through the development of local renewable energy sources.

This was carried out through concept development, regional action plans and site management plans, pilot projects and capacity building.

The project was implemented in Lugansk and Odessa regions, Autonomous Republic of Crimea and Southern Moldova.

The target groups of the project are farmers, nature conservation bodies, local, regional authorities of the project areas and national government.

Ministry in particular supported the relocation from biosphere reserve "Askaniya Nova" in the National Park "Charivna Gavan" (Crimea) 5 individuals of Kulan and 10 individuals of saiga because these species in ancient times inhabited the steppe areas.

Next Steps

Establishment of transboundary Ukraine-Polands biosphere reserves "Poztochchia", new protected areas, including Chernobyl Biosphere Reserve.

Improving of guidelines on development of management plans for protected areas with the purpose to include in their composition mandatory measures to prevent and adapt to climate change, measures against invasive species, etc.

Further involvement of international and government funds to implement specific measures for biodiversity conservation and climate change mitigation and adaptation.

UNITED KINGDOM / ROYAUME-UNI

UK REPORT TO THE GROUP OF EXPERTS ON BIODIVERSITY AND CLIMATE CHANGE UNDER THE BERN CONVENTION, STRASBOURG 19TH JUNE 2014

Reporting by Parties

Governments of Contracting Parties are kindly requested to submit written reports on their relevant actions on biodiversity conservation and climate change, particularly in the light of Recommendation No. 159 (2012) of the Standing Committee on the effective implementation of guidance for Parties on biodiversity and climate change. National reports should be sent to the Secretariat (veronique.decussac@coe.int), in electronic Word format ***by 6th June 2014*** *at the latest.*

Progress since last report in 2012

The UK has developed action plans to respond to the risks identified in the first UK Climate Change Risk Assessment (2012). These action plans include a range of actions to help the natural environment and biodiversity to adapt to climate change.

- England: https://www.gov.uk/government/policies/adapting-to-climate-change/supporting-pages/national-adaptation-programme
- Northern Ireland: http://www.doeni.gov.uk/index/protect_the_environment/climate_change/climate_change_adaptation_programme.htm
- Wales: http://wales.gov.uk/topics/environmentcountryside/climatechange/publications/adaptationplan/?lang=en
- Scotland: http://www.scotland.gov.uk/Publications/2014/05/4669

As part of the England National Adaptation Programme, Natural England and the RSPB, in partnership with the Environment Agency's Climate Ready Support Service and the Forestry Commission have published a new resource: 'Climate change adaptation manual: evidence to support nature conservation in a changing climate' that they will use with conservation practitioners to help them to plan for climate change. The manual gives up-to-date, detailed, habitat-specific information for conservation managers to use, to prepare and respond to a changing climate and includes information on:

- the key concepts for making decisions about adaptation and the impact of climate change on the natural environment;
- climate change impacts and potential adaptation responses for 27 of England's most important habitats; and
- the relationship between climate change and the delivery of ecosystem services.

Scottish Natural Heritage is publishing a set of case studies illustrating principles for helping nature adapt to climate change. The case studies are based around the management of National Nature Reserves. See http://www.snh.gov.uk/climate-change/what-snh-is-doing/helping-nature-adapt/ .

Scottish Natural Heritage has commissioned ClimateXChange (Centre for Expertise on climate change in Scotland) to carry out a risk-based assessment of the effects of climate change on features of protected sites. A full report of the results will be published during 2014. A summary of the work is available at http://www.climatexchange.org.uk/adapting-to-climate-change/assessing-climate-risk-to-notifiable-features/ .

A partnership in Scotland, led by Adaptation Scotland with Scottish Government, Scottish Environment Protection Agency and Scottish Natural Heritage, has published updated information on climate trends in Scotland. The work was done by Sniffer and the Met Office. See http://www.environment.scotland.gov.uk/climate_trends_handbook/