

**Issa Aliyev, Barbara Engels, Bettina Hedden-Dunkhorst,
Anne Katrin Heinrichs and Chie Okada (Eds.)**

**Protection and Utilisation of Biological Resources
for a Sustainable Development,
with Special Reference to Azerbaijan**

Proceedings of a NATO CCMS supported Seminar

held in Baku, Azerbaijan

6 – 7 June 2005



Protection and Utilisation of Biological Resources for a Sustainable Development, with Special Reference to Azerbaijan

Proceedings of a NATO CCMS supported Seminar

held in Baku, Azerbaijan
6 – 7 June 2005

Editors:
Aliyev, Issa
Engels, Barbara
Hedden-Dunkhorst, Bettina
Heinrichs, Anne Katrin
Okada, Chie



Ministry of Ecology and Natural
Resources of the Republic of Azerbaijan

Cover Picture: Coastline in Azerbaijan
Author: Urmas Tartes

Editors:
Dr. Bettina Hedden-Dunkhorst
Barbara Engels
Anne Katrin Heinrichs
Chie Okada

Bundesamt für Naturschutz (BfN)
Federal Agency for Nature Conservation
Division II 1.3 International Nature Conservation
Konstantinstraße 110
53179 Bonn, Germany
Tel: +49-228-8491-242
Barbara.Engels@bfm.de

Issa Aliyev

Ministry of Ecology and Natural Resources
Republic of Azerbaijan
Department for International Cooperation
Tel.: +994-12-492-41-73
aliyev@iglim.baku.az

This publication is included in the literature database "*DNL-online*" (www.dnl-online.de)

BfN-Skripten are not available in book trade.

Publisher: Bundesamt für Naturschutz (BfN)
Federal Agency for Nature Conservation
Konstantinstraße 110
53179 Bonn, Germany
Tel.: +49 228/ 8491-0
Fax: +49 228/ 8491-200
URL: <http://www.bfn.de>

All rights reserved by BfN

The publisher takes no guarantee for correctness, details and completeness of statements and views in this report as well as no guarantee for respecting private rights of third parties.
Views expressed in the papers published in this issue of BfN-Skripten are those of the authors and do not necessarily represent those of the publisher.

No part of the material protected by this copyright notice may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system without written permission from the copyright owner.

Printed by the printing office of the Federal Ministry of Environment, Nature Conservation and Nuclear Safety.

Printed on 100% recycled paper.

Bonn, Germany 2006

List of Contents

OPENING REMARKS

<i>Gossein Bagirov</i> , Minister of Ecology and Natural Resources, Azerbaijan... 7	
<i>Hartmut Vogtmann</i> , President of the German Federal Agency for Nature Conservation	10
<i>Thomas Strassburger</i> , NATO-CCMS Assistant Programme Director.....	11

PRESENTATIONS

Conservation Areas and Landscape Biodiversity of Azerbaijan	
<i>Budag Budagov</i> , Desertification of Azerbaijan Landscapes and its Impact on Biodiversity.....	13
<i>Vahid Hajiyev</i> , Biodiversity of the flora of the Hirkan Biosphere Park.....	16
The Convention on Biodiversity	
<i>Sadagat Mammadova</i> , Protection of Bio-resources and its Rational Use: ..	20
<i>Nugzar Zazanashvili</i> , The Caucasus Ecoregional Conservation Plan as a Tool for the Implementatio of CBD at the Regional Scale	25
Perspectives of Biodiversity	
<i>Umayra Taghiyeva</i> , Possible Negative Effects of Expected Climate Changes in Azerbaijan on Biodiversity	33
<i>Urmaz Tartes</i> , From Nature to Agrobiodiversity	38
International Experience of Biodiversity Protection and Use	
<i>Mustafa Kemal Yalinkilic</i> , <i>Arzu Olgun</i> , Biological Diversity of Turkey	42
<i>Gila Altmann</i> , Central Asia as an Example of International Nature Conservation and Sustainable Regional Development	50
<i>Gabriel Schwaderer</i> , Transboundary Cooperation and Local Sustainable Development along the Balkan Green Belt.....	55

Nature Conservation and Utilisation: Examples from Azerbaijan <i>Eldar Sariyev, Prospects of Development of National Park in Azerbaijan ...</i>	61
<i>M.A. Musayev, Sujaddin Guliyev, Fauna Protection in Azerbaijan and its Main Problems.....</i>	65
<i>Haji Ramazan Ismayilov, Organization and Conduction of Hunting in Economies of Hunters Society Union in the Azerbaijan Republik.....</i>	71
<i>Hikmet Alizade, Aspects of Legislation of the Republic of Azerbaijan on Development of Hunting Economies.....</i>	74
<i>Azer Huseynov, Protection, Maintenance and Reproduction of Animals in the Baku Zoo</i>	77
PROGRAMME.....	80
LIST OF PARTICIPANTS	83

OPENING REMARKS

Gossein Bagirov, Minister of Ecology and Natural Resources, Azerbaijan

Dear Prof. Vogtmann!

Dear Ladies and Gentlemen!

Let me greet you on behalf of the Ministry of Ecology and Natural Resources and wish you a successful seminar. I would like to express my sincere thanks to the NATO representative for NATO's support of the seminar. I would also like to thank colleagues from the German Federal Agency for Nature Conservation to co-organize the seminar with my Ministry. In addition, it is a great pleasure for me to welcome experts from Estonia, Germany, Georgia and Turkey to participate in this event. The seminar is dedicated to a very important topic for Azerbaijan.

Global warming, desertification processes, loss of biodiversity and the spread of various diseases in connection with environmental pollution are the most important global environmental and social problems of today. In the course of time, the implementation of urgent measures for a solution of the aforementioned problems is becoming more important. Problems that were not solved in time and explained as insignificant natural phenomena, now may lead to a process which can cause global, unavoidable disasters for society.

Azerbaijan, which has restored its state independence in 1991, continues its purposeful policy to eliminate current problems in environmental spheres that are one of the main components of the sustainable development strategy for obtaining poverty reduction and economic progress. Thus presently, the legislation of Azerbaijan is brought in conformity with requirements of the European Union (EU), at the same time structural reforms are conducted in the state governing system. This process did not leave out the environment sphere. Ecological principles, inherited from the Soviet Union were improved. More preference was given to ecological awareness, education and enlightenment activities in a widely implemented new management system. Overall grounds for forming of ecological consciousness in the country were created.

At the same time the protection of biodiversity is one of the priority issues in the country. In this context the Republic of Azerbaijan ratified the United Nations Convention on Biological Diversity (CBD) and the Cartagena Protocol on Biosafety.

Azerbaijan is the country with the richest natural-biological resources in the Caucasian region. Thus about 4.500 higher plant species on 9 climatic zones were registered in the territory of the country. The country comprises 64% of the Caucasian flora species and 18.000 of fauna species inhabit the territory of Azerbaijan.

Especially protected natural areas play a significant role all over the world in the conservation of the wild nature and its study. Namely as a result of activities to create especially protected natural areas, it became possible to preserve rare and endangered fauna and flora species.

Attention is paid to the development of specially protected natural areas with the purpose of the preservation of ecosystems in the Republic of Azerbaijan. As a result of purposeful measures carried out by the Ministry of Ecology and Natural Resources, the total area of specially protected natural areas in the country had reached 593110 hectares. Presently 6 National Parks, 13 State Natural Reserves and 19 State Sanctuaries exist in the country, which cover 8% of the country's territory. 1.5% of the country comprise National Parks. Financing of a project to create the "Shah-Dagh" National Park by the World Bank and the Global Environment Facility is under consideration.

At the same time the project of the "Samur-Yalama" National Park is worked out within the program of "The Caucasus Initiative" with the support of the German Federal Government.

A Memorandum of Understanding (MoU) was signed between the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan and the German Financial Cooperation on the preparation of an Eco-regional Nature Protection Program for the Southern Caucasus for the protection of biodiversity in the Republic of Azerbaijan.

The Contract on a Pilot project on the Emerald Network with the Secretariat of the Council of Europe was signed. Besides, a Memorandum of Understanding was signed between the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan and the World Nature Protection Fund on the cooperation in the field of nature protection in the territory of Azerbaijan.

The documents for including the Hirkan forests in the UNESCO world list of World Heritage Sites were submitted to the UNESCO General Secretariat.

A discussion was held in the Ministry of Ecology and Natural Resources with participation of heads of Scientific-Research Institutes of the National Academy of Sciences, employees of various structural sections of the Ministry, representatives of various Public Unions in regard to the publication of the 2nd edition of "The Red Book" of the Republic of Azerbaijan. The Commission was established by a relevant order of the Minister.

Factors leading to loss of biodiversity are mainly related to human activity. Thus, the fact that 12% of the Republic's population became refugee and IDPs, and 20% of the territory is under occupation as a result of the Armenian aggression along with having damaged the country's economy and living conditions of the population, also had a negative effect on the ecological situation. In addition, the main man made factors that effect the Republic's biodiversities are: unsystematic pasture management, non-observation of pasturing norms, non-use of pastures on its destination, non-conduction of grassland restoration, pollution of the environment with industrial wastes in industrial zones and adjacent areas, non-observation of rules on protection of wildlife during harvesting and hay moving, burning of harvested fields, as well as use of pesticides non-registered by state and low quality fertilizers.

Though a lot of measures had been carried out in the field of environmental protection we still have many problems. From this point of view, seminars and exchange of experience

have an irreplaceable role and we highly appreciate it. I hope more meetings will be conducted in future.

Let me once again wish you a successful seminar.



Hartmut Vogtmann, President of the German Federal Agency for Nature Conservation

Conservation and the utilisation of biological resources provide a potential for sustainable development that is often untapped. The Convention on Biological Diversity (CBD) provides an internationally agreed framework for the conservation and sustainable utilization of biodiversity and natural resources and defines criteria for access and benefit sharing. In 2000 Azerbaijan approved the Convention. Five years later this seminar provides a forum to discuss achievements and to exchange experiences among scientists, decision-makers and practitioners.

Biological diversity is essential for the long-term viability of farming activities and forms the basis for various industrial processes. The conservation and sustainable use of biological resources are essential to ensure long term development and to achieve the Millennium Development Goals that focus on poverty alleviation, education and health and the protection of the environment. The Johannesburg World Summit on Sustainable Development in 2002 clearly showed the link between development and the conservation of biodiversity and hence formulated the need to significantly reduce the loss of biological diversity by 2010. Moreover, in Gothenburg the European Council in 2001 adopted the objective of halting the loss of biodiversity in the European Union by 2010. In addition the European programme of the World Conservation Union (IUCN) follows a transboundary/regional approach on the basis of ecosystems and has started a campaign to stop the loss of biodiversity.

Furthermore, the use of natural resources also includes socio-economic aspects. In this respect, Biosphere Reserves can be regarded as innovative instruments for nature conservation, sustainable development and the promotion of peace. The origin of the Biosphere Reserves goes back to the "Biosphere Conference" organised by UNESCO in 1968. The programme, subsequently called "Man and the Biosphere" (MAB) Programme, was officially initiated by UNESCO in 1970. Each Biosphere Reserve is intended to fulfil three basic functions: a conservation function – to contribute to the conservation of landscapes, ecosystems, species and genetic variation; a development function – to foster economic and human development which is socio-culturally and ecologically sustainable and a logistic function – to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development. Conflict resolution is recognised as part of the objectives of Biosphere Reserves. Biosphere Reserves can serve as arenas for airing different points of view and for seeking long-lasting solutions to conflicts of interest, for the benefit of people. Regarding the philosophy of the BfN '*peace with nature is peace between the human beings*' Biosphere Reserves are a platform for dialogue and conflict management, i.e. serving as laboratories for sustainable development.

The Seminar concentrates on aspects of implementation, but also discusses the broader perspectives of biodiversity. Case studies from Azerbaijan and abroad illustrate current achievements and offer best practice examples.

Thomas Strassburger, NATO-CCMS Assistant Programme Director

The Northern Atlantic Treaty Organization (NATO) pursues different approaches with respect to ecosystem changes in relation to economic development, social change and environmental sustainability. Biodiversity can provide a basis for life-support, and contribute to economic development. NATO has established two programmes (NATO Science Programme, NATO Committee on Challenges of Modern Society) that support science, policy and management to improve biodiversity conservation in the host's country. They are both relevant for application in countries in the Caucasus.

NATO welcomes the initiative to conduct a seminar related to biodiversity conservation and thanks the project directors and the government of Azerbaijan for organizing and hosting such event, and the speakers for their contributions.

NATO's new "Security Through Science" programme offers grants to scientists in NATO countries as well as in Partner and Mediterranean Dialogue countries to collaborate on priority research topics. The aim of this programme is to contribute to security, stability and solidarity among nations, by applying science to problem solving. Collaboration, networking and capacity-building are means used to accomplish this international objective. A further aim is to catalyse democratic reforms and support economic development. The priority research topics of this programme are: defence against terrorism, countering other threats to security and partner country priorities. The aim of the programme is pursued through offering different types of grants. Since Azerbaijan has indicated biodiversity as a national priority relevant projects can qualify for project sponsoring under the "Security Through Science" programme.

Moreover, the programme 'NATO-Committee on the Challenges of Modern Society' (CCMS) aims to addressing problems affecting the environment of the nations and the quality of life of their people. The activities of the programme have been expanded over the years to include partner countries in the Euro-Atlantic Partnership Council (EAPC) and more recently takes into account emerging issues to security. In line with NATO's strategic objectives the following key objectives have been identified: Reducing the environmental impact of military activities, conducting regional studies including cross-border activities, preventing conflicts in relation to scarcity of resources, addressing emerging risks to the environment and society that could cause economic, cultural and political instability and addressing non-traditional threats to security. These objectives are not exclusive or restrictive. The primary criteria for initiating CCMS activities remain the interest of a sufficient number of nations to work collectively on topics related to challenges of modern society in line with the five key objectives, and their willingness to commit resources. Work is carried out on a decentralised basis, mainly through pilot studies (3 to 5 years) and short-term projects (12 to 18 months), which are nationally funded. Activities also include topical workshops and the co-sponsoring of international conferences and seminars. This seminar is a good example for the objectives and mechanisms of work done under CCMS.

The seminar has been organized as part of the so-called "NATO week" in Azerbaijan. It is to be hoped that it will serve as a catalyst for further co-operation on this topic, which could in

the case of the Caucasus region relate to the CCMS key objective “conducting regional studies including cross-border activities”.

Currently there are a number of projects carried out, under both, the Science Programme and CCMS that, through international efforts, contribute to alleviate environmental problems of the Caspian Sea, and to provide stability to the region (Azerbaijan, Kazakhstan, Russia, and Turkmenistan). Moreover, a pilot study titled “Environmental Decision-Making for Sustainable Development in Central Asia” is currently carried out with NATO’s support. Participating countries are Azerbaijan, Georgia and Armenia. In addition, there is a NATO Science for Peace Programme in place, which is concerned with a South Caucasus river monitoring. The general objective of this project is to establish the social and technical infrastructure for an international, cooperative transboundary river water quality and quantity monitoring, data sharing and watershed management system among the Republics of Armenia, Azerbaijan and Georgia. Finally, the Virtual Silk Highway Project connects the academic communities of eight Central Asian and Caucasian countries: Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan.

PRESENTATIONS

Conservation Areas and Landscape Biodiversity of Azerbaijan

Desertification of Azerbaijan Landscapes and its Impact on Biodiversity

Budag Budagov, Geography Institute, Azerbaijan

About 60% of the Azerbaijan territory has semi-desert climatic conditions. According to E. M. Shikhliniski (1963), the central and eastern parts of the Kura-Araz lowland have temperate hot semi-deserts and dry steppes with dry summers. Temperate hot semi-deserts and dry steppes with dry winters prevail in the western part of the Kura-Araz lowland, i.e. towards west from meridian Agdash-Agjabedi. These climatic conditions cover territories of Gobustan, Absheron peninsula, Samur-Devechi lowland, plain-foothills territory, stretching out along the left side of the Araz River on Zangelan-Jabrail section. The territory of Shirvan, Mil, Mugan and the south-eastern part of Salyan steppes also have the same climatic conditions.

It is to be noted, that these climatic conditions have impacts on the climate of adjacent low mountain and foothills areas, landscapes which become drier. As a result of new developments of the semi-desert and dry steppes, land used for agriculture needs to be irrigated. It is known that frequent irrigation of land in arid climatic conditions accelerates the salinisation of top-soils. After the construction of the dam of Mingechaur, waterworks facility and building of the Upper-Mugan and Upper-Karabakh irrigation channels and the rapid expansion of irrigated lands, mainly for cotton yards, the salinisation of top-soils increased significantly. Undoubtedly, with the expansion of irrigated agriculture wide areas were cultivated, which destroyed the natural herbage that led to the reduction and in some cases to disappearance of certain species of fauna, which are typical for semi-deserts. The expansion of cultural land cultivation and the destruction of riparian woodland and rising surface water levels had caused large salinisation and frequent logging of soils etc. The actions aimed for improvement of soils did not succeed because of different reasons, including some bent of location where the lowering of relief makes 28 meters in a distance of 200 km.

In such relief conditions applying active drainage with washing salts in the top-soil, some useful microelements are taken out and humus also is washed out from the soil. So, within lowland and foothills territories of Azerbaijan, where semi-desert and dry steppe climates are developed, desertification occurs, which in its turn affects negatively on adjacent territories. In other words, desertification goes out of natural borders of semi-desert and dry steppe landscapes.

To slow down desertification and prevent its expansion to adjacent territories, it is necessary to take some actions to fight against the desertification process: it is necessary to strictly observe standardized irrigation, worked out by specialists; it is purposeful to make a concrete covering of the surface of some irrigation systems, including channels and irrigation ditches;

it is necessary to have forestation, according to recommendations, worked out by scholars-botanists and other relevant experts.

It is furthermore important to restore field protection forests, which were previously available and planted in 1950-1955. Large measures have been conducted and are carried out in the territory of Azerbaijan for the creation of State Reserves and National Parks, which preserve in certain degree the biodiversity of landscapes.

Reserves and national parks were created within limits of all types and semi-types of landscapes, beginning from semi-desert till highland nival-ice lines. Carrying out measures gave already significant results in restoration and reproduction of many birds and mammals. Trends in restoration of upper border of highland forests and mountainous plain landscapes are visible.

The significant enlargement of territories of reserves and national parks is a worthy case. It is purposeful to strengthen the protection of all landscape complexes, including the fauna. We'd like to focus on two issues, which have in our mind essential importance for preserving the landscapes' integrity of the Republic of Azerbaijan. First, it has to be noted that in the Lenkoran natural zone of Azerbaijan high and mid zheltzem podzolic gley soils are developed. To preserve the rare zheltzem it is necessary to strengthen the control over distribution of these lands to private landowners, who are ignoring its agricultural-economic values and use these lands for construction of residences, industrial objects, etc.

In our opinion, it is necessary to stop the inexpedient use of these lands and to attract attention of competent bodies to use these rare natural fertile soils for planting of citrus plants and for tea-plantations. The mentioned actions are to be implemented within a short time, otherwise after some years these recommendations will be of no use.

Second, for the last 10-15 years, due to occupation of Azerbaijani lands by Armenian aggressors and deportation of habitants from native lands, the population of Baku and Absheron peninsula had grown, where the ecological conditions worsened, lakes and ponds were polluted, and turned to be sources for infections. Expansion of construction of residential buildings and other objects led to violation of natural conditions of slopes and ridges causing a higher frequency of landslides and landslips of man made origin. Wrong use of waters of the Samur-Absheron irrigation channel led to logging of some territories, to an increase of erosion and to rising of level of surface waters. Periodic fluctuation of the Caspian Sea level creates mass tension along the coast. At the rising of sea level some abrasion along the coast has appeared, beaches are flooded, works of seaports and oil fields are getting complicated. To prevent negative consequences it is necessary to have strict state control, including private owners.

Third, Shollar the lowland and adjacent foothills of northern-eastern slope of the lower mountains are huge reservoirs of groundwater, which provide valuable drinking water for the population of the north-eastern region of Azerbaijan, including Baku, Sumgayit and adjacent settlements. In this connection it is necessary to take care of the increase of natural feeding of groundwater of the Shollar lowland.

Waters of the Samur River are utilised in the north in the Dagestan Autonomous Republic of Russia and in the south by the Republic of Azerbaijan. Waters of northern-eastern rivers of the Caucasus- Kusarchay, Kudialchay, Karachay, Velvelichay are also distributed, which are directed through the Samur-Absheron channel to Baku city. So, the underground feeding of Shollar water basin has worsened, which is used for more than one century.

In our opinion, it is necessary to provide a feeding spring of the underground reservoir of the Shollar hydro-geological object. This should be done via restoration of river channels at their exit from mountain to lowland (Samur, Kusarchay, Kudialchay, etc). These measures are to be taken immediately, as the delay will inevitably lead to negative consequences.

Biodiversity of the flora of the Hirkan Biosphere Park

Vahid Hajiyev, Institute of Botany of Azerbaijan National Academy of Sciences

Relict forests that formed various structures were destroyed consciously or unconsciously since a long time and especially when economic conditions were hard. As a result of the arrival of European scientists coming to the region in the 19th and 20th century and particularly at early 20th century this destruction could be stopped to a certain degree. The discovery of hundreds of new flora species by botanists between 1800 and 1900 is a proof of that.

The expeditions of A. A. Lomakin (in 1894, 1895, and 1897), Y. S. Medvedyev (1882, 1902, and 1919) and many others to the region could prevent forest destruction. The most famous scholar of Caucasian flora, the academician A. A. Grossheim made 12 botanical trips to the Caucasus in 1912-1918 and discovered 109 plants together with his students. The list of literature shows that botanists from western European countries had great interest in this region in the past and that they wrote hundreds of scientific works about the growth of Talysh flora. These rich relict species were included in the world "Red book" by now and many of them are grown in botanical gardens and are preserved as a collection in gardens and national parks.

Those relict species from the tertiary include: *Parrotia persica*, *Albizzia julibrissin*, *Quercus castaneifolia*, *Zelkova hyrcana*, *Diospyros lotus*, *Ruscus hyrcana*, *Ilex hyrcana*, *Danae racemosa*, *Buxus hyrcana*, etc. Perennial herb species are abundant in the area. Real type representatives, i.e. old forest, boreal, steppe, xerophytes and adventitious plants are also met here.

There also exist many small lakes, swamps, and non-running waters in the area, in which developed peculiar rich flora in various appearances. Reed jungles of *Phragmites australis* are often located in river banks. Two sorts of Asclepiadaceae (*Cynanchum acutum* and *Periploca graeca*) are also found in river banks. *Alopecurus myosuroides* prefers wet places as well. Some types of *Typha* (*T. angustata* and *T. angustifolia*) create jungles in swamps and hot areas of the territory. Savanna type height plume grass (*Erianthus purpurascens*) is met here. *Cynodon dactylon* and *Bolboschoenus maritimus* are found in pit areas. The *Bolboschoenus maritimus* jungle is similar to reed jungles regarding its structure. In the sea shore swamp areas of the territory are mainly existent *Potamogeton pectinoides*, *P. lucens*, *Myriophyllum spicatum*, *Trapa hyrcana*, *Lemna minor*, and other plants which create swamp formations in foothill areas. *Iris pseudacorus*, *Sparqanium erectum*, *Schoenoplectus lacustris*, and *Eleocharis palustris* create special formations.

Some types of plants like *Ranunculus sceleratus*, *R. hyrcanus* (endemic in the Caucasus), *R. bulbosus.*, *R. arvensis*, *Buchia laterifolia*, *Lippa nodiflora*, *Mentha aquatica*, *Polygonum minus*, *Alisma plantago-aquatica*, etc. are easily found in drying swamp areas, where perennial herbs with lower height are spread out. Water-swamp plants are also found in medium and high mountain belts.

Taxonomic biodiversity of flora

I was well informed about the numerous herbariums collected by world botanists during the 19th and 20th century. As results of the botanical expeditions made by us to Talysh Mountains in the last 50 years monographic works about the flora were written by botanists. Especially volumes I-III are dedicated to Azerbaijan and volume VII to Caucasian flora, including our joint work called "Flora and plants of Talysh" (1979). I supported the biodiversity of flora and the establishment of Hirkan biosphere preserve.

There are about 481 spore-bearing plants and high plants in Hirkan Biosphere reserve; which are shown in Table 1 below:

Table 1

Types	Season	Sorts	Kinds
Spore-bearing	9	13	15
Open seed	2	2	3
Covered seeds	65	255	463
<i>Including</i>			
One chambered	22	60	81
Two chambered	43	180	480

Forest growth

As it was said above the Hirkan biosphere reserve covers Lankaran, Lerik and Astara administrations regions, i.e. it is stretching from sea side regions to lower mountainous belt (Burovar mountain range) to medium mountainous belt (Peshatashar mountain ranges) and at last high mountainous belt (Talysh mountain range).

1. Lower mountainous belt – covers town surroundings, villages, gardens, greeneries and cultivation areas (tea, citruses, millet and vegetables and melon plantation).
2. Medium mountainous belt – separate villages, haymaking areas in near-forest zones, citruses, tea and villages and gardens, including natural Hirkan mixed forests covering the area.
3. High mountainous belts – covered by Hirkan forests. Haymaking areas and pastures were formed in near-forest areas.

Generally in all three belts of Hirkan original forests, especially *Parrotia persica*, *Quercus castaneifolia*, *Carpinus macrocarpa*, *C. orientalis*, *Zelkova carpiniifolia* are existent. In swamp areas *Alnus barbata*, and herb plants like *Carex remota*, *Cardamine tenera*, *Lycopus europaeus* and many others are found under forests, and herb plants are considered as permanent plants of this forest. In foothill areas you may find Hirkan sorts of 3-4th class, which were mentioned above, like *Ficus carica*, *Punica granatum*, *Buxus sempervirens*, *Ruscus hyrcana*, *Crataegus monogyna*, and herb plants like *Rumex*, *Sambucus*, *Poa*, *Primula*, *Viola*, *Solanum*, *Oplismenus*, *Carex*, *Allium*, *Sedum*, *Crocus* and many others.

Parrotia persica (iron tree) is not found in medium mountainous belt. It is replaced by *Fagus orientalis* in northern hills of this belt, while *Quercus castaneifolia* gains majority in the southern hills of this height. They create real Hirkan forests with mixed broad-leaved trees being in the first layer. Besides *Quercus castaneifolia* and *Fagus orientalis* also *Taxus baccata*, *Carpinus betulus*, and *Zelkova carpiniifolia* can be found. In the third floor of the

forest herb plants like *Carex*, *Mentha*, *Brachypodium*, *Orobus*, *Solanum*, *Festuca*, *Bromus* etc. are present. Liana type plants are not found here. Compared to lower forest belts, the forests of medium belts are not thick, but rather clean. Lianas can not embrace them like in lower belts, so that movement in forests and walking there causes good impressions. Forest species are well developed there, they are of 20-25 meter height and even can reach 30 meter. The forests are very open. As the diameter of the trees is ordinary, they create good conditions for herb plants near to the ground, since the leaves can create a grass like ground together with gramineous plants. This belt is important for tourism as well.

In medium belts and northern hills under-forest plants are important for Hirkan forests being in first plan. Here *Hedera pastuchowii* can create liana type environment by embracing the big plants of the forest. *Ilex*, *Danae*, *Mespilus*, *Crataegus* as some kinds of under-forest plants are found in this hills. Besides that *Sorbus torminalis*, *Pinus sp.*, *Cydonia oblonga*, *Pyrus*, *Rosa*, *Rubus* and other bush plants are found separately in northern hills. Herb plants prevail in these hills.

Taxus baccata is one of the coniferous plants being widely distributed in Caucasus mountains. Spread together with bushes in Hirkan mixed forest it creates black forests near to Siyov village. A. A. Grossheim had shown the existence of *Taxus baccata*, *Carpinus schuschacensis* and *Lonicera iberica* and 32 different types of herb plants and I had shown that there are even 45 types of herb plants in 1979. Being right A. A. Grossheim explained this forest with regeneration. It seems that the forests near to Siyov village were exposed to destruction. One part of the black forest was fired. Therefore the majority of plants were xerophytes, which still can be found now.

By going up the mountains the relief is getting harsher, the number of rocks and the inclination of mountains increases, and the forest continues its normal development. But some changes in landscape can be felt. Forests turn to be not like as in lower belts and are instead getting a form of wide spots, apparently due to the harshness of mountain rocks, and poor and rocky soils. In these area *Quercus macranthera* prevails and creates mixed forests together with *Carpinus orientalis*. Three different types of birch, *Acer laetum*, *A. velutinum*, *A. campestre*, *Carpinus caucasica*, *Quercus castaneifolia*, *Fraxinus excelsior*, *Ilex hyrcana*, *Mespilus germanica*, three types of *Crataegus*, *Euonymus latifolius*, *Pyrus*, *Rubus* and *Lonicera* are found here. Lianas are not existent in these forests, but herb plants are quite enough. There are also gramineous plants like *Poa nemoralis*, *Dactylis glomerata*, *Poa pratensis*, *Brachypodium sylvaticum*, *Agrostis tenuis*, and various herbs like *Dryopteris filix-mas*, *Sanicula europaea*, *Campanula rapunculoides*, *Digitalis nervosa*, *Geum urbanum*, *Fragaria vesca*, *Orobus*, *Stachys*, *Carex*, *Primula stellaria*, *Calamintha*, *Silene*, *Asplenium*, *Luzula*, *Centaurea*, *Lilium*, *Melica*, *Trifolium*, *Briza*, and *Bromus* found here. We have shown in 1979 that there were 55 different types of herb plants in this forest. Only *Trifolium* has five types in this forest. Whether herb plants are found more or less in this forests depends on the abundance of constructions and where the forest is located on the mountain. Endemic *Paeonia mlokosewitschii* and *Lilium ledebouri* are also often found in these forests.

In upper belts, where forests are getting less, bushes create jungles together with herb plants. In these jungles the restoration of forest trees is not visible and not felt. Despite forest seed fall in these areas the layer of soil prevents the growing of seeds which is why the

restoration is not visible. The forest is replaced by mountain xerophytes, bushes and perennial herbs of Phrygana type.

Phrygana or mountain – xerophytes plants

These types of plants can be found in areas with harsh and complicated relief and in mountains and hills covered with rugged rocks. Mountain xerophytes of phrygana type are formed in various structures mostly in all belts but more in southern and south-eastern hills. According to A. A. Grossheim (1948) these types of plants are considered to be the oldest ones – they are remnants from the tertiary. According to L. I. Prilipkov this type of plants are mostly formed in chalk containing hills in Hirkan heights, in open mountain environments. They begin blossoming in early spring (therophytes) at the mountainsides. This applies especially to plants with bulbous and round roots like *Gagea*, *Prophus*, *Crocus*, *Orchis*, *Allium*, *Colchicum*, *Puschkinea*, *Muscari*, *Merendera*, *Ornithogalum*, etc. In spring the mountainsides of the region are covered and decorated with colorful flowers (yellow, red, white etc.). The spring flower landscape covers about 55-60 days of the year. When spring turns to summer the plants replace each other. In Phrygana type hills the flowers and colors of *Allium* and *Iris* replace each other. Four to five sorts of *Iris* are found here (*Iris zuvandicus*, *I. hyrcana*, *I. medwedewii* and *I. lineolata*). Out of 44 wild *Allium* of Azerbaijan only 17-18 are found in dry mountainside areas, of which five are endemic plants (*Allium virida*, *A. dictyopranicum*, *A. transcaucasicum*, *A. synthamanthum*, *A. lenkoranicum*). From goose bulbous only two types of endemic (*Gagea alexeekoana* and *G. Caroli-kochii*) are found in these hills. From the xerophytes bushes and perennial herbs of decorative type *Acantholimon*, *Hedysarum*, *Stachys*, *Salvia*, *Dianthus* and *Rosa* are considered to be the main components of these plants.

Mountain-xerophytes and phrygana type plant cover are separated in two formations: Tragacant and Acantholimon formations. Due to ecological and geomorphological structures both formations show a similar floristic structure and have the same ecological presence. Though Tragacant soil is made of chalk it consists of small rocks and poor soils. Acantholimon type of soils has a slight humus layer and despite the flora structure which has the same amount of sorts Acantholimon has more than Tragacant. Important for Tragacant are *Astragalus aureus*, *A. lagurus*, *A. pichophyllus*, *A. strictiformis* and bushes – *Onobrychis cornuta*. From gramineous plants *Stipa szovistsana* is significant by making the formation of steppe, meadow and stepped meadow with 40-60% of the layer. The flora contains about 67-70 sorts. From gramineous plants these are *Stipa szovistsi*, *Festuca sulcata*, *Bromus tectorum*, *B. squarrosa* and *Euphorbia marschalliana*. *Cousinia* (3 species) *Nepeta*, *Lactuca*, *Teucrium*, *Scutellaria*, *Cirsium*, *Phlomis*, *Ziziphora*, *Verbascum*, *Gypsophila* and many other genera have one, two, three species. In this biocenosis about 82 sorts of plants were registered. Two species like *Acantholimon hohenackeri* and *A. sp.* as species of *Acantholimon* formation cover 68-80% of the surface. It has rich flora. Here only *Cousinia* (3 species), *Cirsium* (2 species), *Achillea* (2 spec.), *Plantago* (2 spec.) and as gramineous plants *Festuca sulcata*, *Stipa* (2 spec.), *Poa pratensis*, *Phleum phleoides*, *Astragalus aureus* and *Juniperus oblonga* – a total of 97 species of vascular plants can be found. It has to be noted that mountain-xerophytic plants of Hirkan biosphere reserve are very similar to those of Nakhichevan and Iran, the areas located closely to Hirkan reserve. Still it may be said that the majority of the flora in the biosphere reserve is specific to Hirkan.

The Convention on Biodiversity

Protection of Bio-resources and its Rational Use: Obligations from the Convention on Biodiversity and implemented measures

Sadagat Mammadova, Ministry of Ecology and Natural Resources, Department for Biodiversity Conservation and Specially Protected Nature Areas, National Focal Point of the CBD, Azerbaijan

Protection of natural resources and its sustainable use is one of the most important and global problems of the XXI century. Biological diversity as being an integral part of natural resources is a huge, rich resources' source. Biological diversity is the variety of all living organisms of the world, i.e. microorganisms, plants and animals and by covering the ecosystems to which they belong, make the base of life presence. Biological diversity is not just the variety of species; it comprises the multitude of signs and genes, which facilitate living and developing of live in the world.

Taking into account the possibility of saving the biological diversity in the world by international cooperation, first time at the Global Summit held in June 1992 in Rio de Janeiro the protection of biodiversity was accepted as an integral part of general and sustainable development of the whole civilization and the relevant Convention was signed in this regard. The Azerbaijani Government taking into account the importance of the "Convention on Biodiversity" had joined the said Convention on March 14, 2000. The main purpose of joining the Convention is to ensure active participation of the Republic of Azerbaijan in Programmes and projects on protection of biodiversity, sustainable use of bio-resources for present and future generations, equal and just sharing benefits, gained from use of genetic resources.

According to Article 8 of the Convention special protection measures are taken into account in the Republic for the protection of biodiversity. In order to bring the system of especially protected natural territories into conformity with modern requirements in the Republic (protection of important ecosystems and main species, creation of corridors and protection lines), the necessity to carry out some active actions has arisen now.

Let's look at the division of especially protected natural territories in the Republic. The protected territories were created in regions that are rich in biological diversity in the Greater Caucasus, Lesser Caucasus, The Kura-Araz lowland and Talysh areas by selective principles. In this connection a Commission, consisting of representatives of relative Ministries and Committees was set up by the Ministry of Ecology and Natural Resources. According to scientifically grounded opinion of the Commission, especially protected natural territories had been created in areas having rich biological diversity.

The development of especially protected natural territories plays an important role in the protection of ecosystems. As a result of the activity of especially protected natural territories the opportunity was created for protection of rare and endangered flora and fauna species.

The Republic of Azerbaijan is a country with most rich natural resources in the Caucasus Region. The human activity connected with the natural environment and resources result in the expansion of man made affected landscapes and causes a significant increase of violation of initial conditions of natural complexes. Presently it is not possible to find natural complexes that were not subjected to human influence. Namely, due to this reason especially protected natural areas are of great importance for the protection of natural complexes and to study natural movements of natural processes.

It has to be noted, that the issues of the development of a network of especially protected natural territories and protection of biodiversity in the Republic always were under attention of the country's leadership.

As a result of purposeful actions carried out by the Ministry of Ecology and Natural Resources in the direction of creation of natural protected areas and an ecological network, the first six national parks were created. Along with the creation of two State Natural Reserve and Gakh State Natural prohibited area, the areas of five available State Natural Reserves (SNR) (Turyanchay, Pirguly, Ismayilli, Ilisu, Garayazi) were expanded.

The first national parks in Azerbaijan are: Ordubad National Park named after the Academician Hasan Aliyev, Shirvan and Ag-gol National Parks and Shahbuz State Natural Reserve, which were created under personal guidance and Resolution of National Leader Mr. Heydar Aliyev in 2003. Later sequence actions carried out in this direction were continued and under permanent care of our esteemed President Ilham Aliyev Hirkan, Altiagaj National Park and Eldar pines state Natural Reserve and Absheron National Park were created in 2004 and 2005 subsequently. The creation of national parks, state natural reserves, state prohibited areas, the expansion of current prohibited areas in the Republic is the expression of daily attention by the President of the country on the development of especially protected areas, the protection of nature, passing it to future generations and at the same time a successful result of policy carried out in the country in the field of creation of new workplaces.

Presently, meaningful follow-up actions are taken in direction of the development of especially protected natural areas in the Republic. Thus, even though till 2003 Azerbaijan had no national park, now especially protected natural territories in the Republic of Azerbaijan occupy a total area of 593.000 hectares and account for 8% of the Republic's territory, whereas national parks account for 1.5% of the Republic's territory.

Despite the unequal location of reserves and national parks in the Republic, they cover main landscapes and are of great importance for the protection of especially rare and endangered flora and fauna species of natural complexes and in passing them to future generations. Scientific-research works, conducted by staff of the Azerbaijan National Academy of Sciences, NGOs in especially protected areas of the Republic once more proved that the followed sequence wise purposeful actions carried out in connection with development of special natural areas are yielding its fruits. The increasing number of gazelles and water-swamp birds in the Shirvan National Park, the number of rare water swamp birds in the Ag-gol National Park within short time have been observed, traces of leopard, hyena, lynx, bear, rush cat etc. were seen in expanded area of the Ilisu State Natural Reserve, in mountainous zones of Akhar-Bakhar along with the northern bank of water reservoir of Mingchevir, that

was declared as a reserve. This area is an irreplaceable place for nesting for birds of prey and mammals. Nests of snake eaters and griffons are often met. Development of especially protected areas for purposes of protection of such unique biotopes, is one of the vital issues of today.

Necessary legislation norms and other regulations had been worked out for the protection of endangered species and populations and actions are taken in accordance with these legislative acts. The national legislation in the field of protection of biological diversity is formed by taking into account international agreements and conventions that the Azerbaijan Republic joined. The following laws were adopted in the last years, which regulate the protection of environment:

“On environment protection” (1999), “On especially protected natural territories and objects” (2000), “On animals” (1999), “On plant protection” (1996), “Forest code” (1997), “On hunting” (2004), “General regulations of State natural and biosphere reserves” (2001), “General regulations of the Republic of Azerbaijan on National Parks” (2001).

By relevant decisions of the Council of Ministries “Rules on protection and consumption of animals included in the name list of especially protected animal species”, “Rules on bringing and taking away the animals to the Republic of Azerbaijan”, “Some normative legal acts related to hunting in the Republic of Azerbaijan”, “Rules of implementation of state control over protection and consumption of animals”, “Types of payments, its degrees and rules of application for consumption of animals and fines on illegal animal hunting”, “Instruction on apply of fines on illegal wild animals hunting and payments for use of animal objects”, “Hunting rules in the Republic of Azerbaijan”, “Regulations on hunting economies” were approved.

Moreover mutual cooperation MOUs were signed with international organizations:

- A MOU on “Preparation of Ecoregional environment protection programme for the Southern Caucasus”, between the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan and the “KfW” Financial Cooperation of Germany (2004);
- A contract “On Emerald pilot network, between the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan and the Secretariat of CE”(2004);
- A “Mutual MOU on cooperation in the field of nature protection in the territory of the Republic of Azerbaijan, between the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan and the World Nature Protection Fund” (2004);

At the same time, the Republic of Azerbaijan had joined in 2005 the Cartagena Protocol on Biological safety of the CBD.

According to the provisions of Article 7 of the Convention on Biological Diversity, the following works are carried out for the protection of biodiversity and prevention of activities that negatively affect or may affect on its continuous use:

- definition of protected zones for purposes of prevention of lessening man made influence on protected biocenosis;
- working out of state acts on rights on permanent use of soil of especially protected natural territories (all state natural reserves and national parks);
- exact definition of borders of reserves, national parks and prohibited areas for ensuring the protection regime.

Presently, field research works on exact definition of borders of National Parks and Reserves by surveys and forest structure expeditions are carried out.

While creating new especially protected natural territories, the importance of protection of all natural complexes in this field and the results of monitoring are taken into account.

According to the provisions of Article 9 of the Convention (ex-situ conservation), conditions for the protection of plants, animals and microorganisms are created and strengthened.

According to Article 10 of the Convention (sustainable use of components of biological diversities), the prevention of negative affects on biodiversity is the main focus.

One of the problems that seriously affects living nature of the Republic, is the fact that Basitchay and Garagol State nature Reserves, Dashalti, Lachin, Gubadli, Arazboyu state natural prohibited areas and some valuable and rare natural monuments remain in the territory of the 20% occupied lands of the Republic. The total area of occupied natural territories is 44.300 hectares, which make up for 10% of the Republic's areas of reserves and prohibited areas. More than 150 years old trees and 13.197,5 hectares of valuable forest and 6 geological objects still remain within the occupied areas.

Yet the existence of about 1 million refugees and IDPs caused an increase of man made influences on the environment. Absence of gas and other fuels in areas resided by refugees and IDPs led to illegal cutting of trees from forests and its use as fuel.

Unsystematic pasturing of cattle in pastures, non-observation of pasturing norms, and non-utilization of pastures on its designation causes loss of biodiversity. In order to remove all these shortages relevant measures are taken, such as: provision of the population with alternative fuels, creation of new forest areas, etc.

Ecological enlightenment of population

According to Article 123 of the Convention, lessons are arranged in Qualification Improvement Courses in the Ministry of Ecology and Natural resources for information of the public, protection of biodiversity and for understanding the importance of these measures. To provide its propaganda in mass media, various booklets and brochures are printed in this regard. To study biodiversity and its protection, training and behaviour works are conducted within ecological education and enlightenment of population. A law "On ecological education and enlightenment of the population" of the Republic of Azerbaijan was approved (2003). Centres for ecological education and behaviour are operative in all regions and towns of the Republic.

Despite having old roots the process of ecological education and ecological outlook's forming began to be extensively propagandized in the Republic in the last decade. Broad prospects were created for development of ecological education and forming of ecological outlook within education reforms. Some governments and NGOs, public unions and others have conjoint measures.

Local Staff of MENR, Nature Protection Fund and NGOs inform the population on spots about biodiversity, its protection and in general about nature, flora and fauna.

International projects on study of biodiversity:

- “Strategy and implementation plan on Caspian Sea biodiversity”
- “Evaluation of national requirements for purposes of the solution of global ecological problems”
- “Preparation of a Country report, a strategy and an implementation plan on biodiversity”

Projects financed by World Wild Nature Fund:

- “Preservation of leopards in the Caucasus ecoregion”
- “The Strategy on biological resources for the protection and sustainable use of biodiversity in the Caucasus ecoregion”
- “Sustainable use of herbal plants in the Caucasus ecoregion”
- Work is conducted for sustainable use of biodiversity.

By Nature Protection Fund named after M. Zukkov:

The “Project on saving of Ag-gol” was completed. The main aim of the project is to protect national and cultural heritage of Azerbaijan.

Organizations that implement biodiversity protection and management:

The Parliament of the Republic of Azerbaijan is a legislative body for issues regarding the protection and preservation of bio-resources. According to the Convention on biodiversity the State Commission on protection of the genetic pool was set up for the fulfilment of obligations of the Republic of Azerbaijan, like the prevention of endangerment of genetic pools of plants, animals and microorganisms.

The Ministry of Ecology and Natural Resources, relevant institutes of the National Academy of Sciences and the Ministry of Education carry out important works on environment protection. One of the duties of the MENR is the research of natural resources and their effective use, the restoration, protection and ensuring of ecological safety in this field and implementation of state policy for biodiversity protection.

The expansion of protected areas in the Republic and the creation of State parks are important actions done by the State. They play a fundamental role in the preservation of biodiversity. The Constitution of the Republic of Azerbaijan at a legislative base, the improvement of the structure of management of the ecological sector and the increase of the number of NGOs are factors positively impacting the protection of biodiversity. The Government of the Republic of Azerbaijan pays special attention to the solution of ecological problems, the protection of biodiversity and its management. Two National Programmes (Sustainable Social-Economic Development and Restoration of forests and its increase in RA) accepted in 2003, created great opportunities for the establishment of national parks, state natural reserves, state natural prohibited areas, and the expansion of areas of current state reserves, in order to preserve the biodiversity of the country.

According to the CBD, the Republic of Azerbaijan fulfils its obligations and carries out important actions for the prevention of endangerment of flora and fauna and microorganisms.

The Caucasus Ecoregional Conservation Plan as a Tool for the Implementation of CBD at the Regional Scale

Nugzar Zazanashvili, WWF Caucasus Conservation Directorate, Georgia

The Caucasus Ecoregion

The Caucasus Ecoregion, historically interpreted as the isthmus between the Black and Caspian seas, covers a total area of 580.000 km², and spans six countries – Armenia, Azerbaijan, Georgia, the North Caucasus as part of the Russian Federation, north-eastern Turkey, and parts of north-western Iran (Map 1).



Map 1: Caucasus Ecoregion

As one of the most biologically rich regions on Earth, the Caucasus is ranked among the planet's 25 most diverse and endangered hotspots (Mittermeier et al., 1999). The Caucasus is core part of one of WWF's Global 200 vulnerable ecoregions, identified as globally outstanding for biodiversity (WWF, 1997): located at a biological crossroad, species from Central and Northern Europe, Central Asia and the Middle East and North Africa mingle with endemics found nowhere else. Over 6.500 species of vascular plants are found in the Caucasus. At least a quarter of the plants are found nowhere else on Earth – the highest level of endemism in the

temperate zone of the northern hemisphere (Myers et al., 1999). One-third of the endemic plants in the Caucasus Ecoregion are thought to be originated in the Greater Caucasus Range. Seventeen endemic plant genera thrive in the Caucasus, nine of which are associated with high mountain communities (Dolukhanov, 1966). Plant associations from the Tertiary period have been preserved in the Colchic and Hirkanic refugia – centres of plant endemism (Dolukhanov, Nakhutsrishvili, 2003; Zazanashvili, Gagnidze, Nakhutsrishvili, 2000). At least 153 mammals inhabit the Caucasus; one-fifth of these are endemic to the region. As many as 400 species of birds are found in the Caucasus, four of which are endemics. The coasts of the Black and Caspian seas are important stopover sites for millions of migrating birds, flying over the isthmus each spring and autumn between their summer and winter homes. 22 of the 77 reptiles in the Caucasus are endemic to the region. 14 species of amphibians are found here, of which four are endemics. More than 200 fish species inhabit the rivers and seas of the Caucasus, over a third of which are found nowhere else (Zazanashvili, Sanadiradze, Bukhnikashvili, 1999). The 2004 IUCN Red List identifies 50 species and two subspecies of globally threatened animals in the Caucasus.

The Caucasus is also a globally significant centre of cultural diversity, where a multitude of ethnic groups, languages, and religions intermingle over a relatively small area.

Ecoregional Planning

The Reconnaissance, Biological and Socio-Economic Assessments, Biodiversity Visioning, and preparation of Ecoregion Conservation Plan (ECP) are the stages of ecoregional planning (Ref). ECP of the Caucasus Ecoregion is the outcome of a series of stakeholder workshops held from 2002-2004, combined with background reports and assessments coordinated by the WWF Caucasus Programme Office. More than 160 experts from the six countries participated in preparation of the ECP representing a variety of scientific, governmental, and non-governmental organizations. During preparation of ECP National strategies and action plans for biodiversity conservation and the development the protected area systems were considered. Apart from this, existing conservation strategies and investment portfolios, such as those prepared with support from the MacArthur Foundation, the German Bank for Reconstruction and Development (KfW), and the Critical Ecosystem Partnership Fund (CEPF), were incorporated into the ECP.

The main directions for biodiversity conservation in the Caucasus Ecoregion were elaborated in the biological and socio-economic assessments. Conditions of a number of species were assessed, thematic digital maps illustrating natural ecosystems, protected areas, actual infrastructure and demography, land use and land cover, etc. were prepared and analyzed. Assessment of the major threats to biodiversity and root causes – poverty, lack of public awareness, lack of transboundary cooperation, and others – were used for determination of the strategic areas of intervention. Four priority biomes – forest, freshwater, marine, and high mountains – have been identified, which will be the biogeographical focus of conservation efforts, as these contain the bulk of biodiversity with the most pressing threats. Twenty-six focal species were identified and will be targeted, where habitat protection alone is not enough to guarantee survival of the species. Yet, even by limiting conservation strategies to the priority biomes and focal species, we are left with an enormous area to conserve given the limited funds of the regional and international conservation community. Therefore, the goal of this ECP was to narrow the focus into a set of Priority Conservation Areas (PCAs), based on the need to preserve the most important areas for biodiversity in the Ecoregion, while representing the four priority biomes and 26 focal species.

Once the priority biomes and focal species were agreed upon, PCAs were determined to help to focus conservation measures in the places that are the most significant for biodiversity conservation in the Ecoregion. Next, a biodiversity vision statement was elaborated – an image of what the Caucasus Ecoregion should be like in 50 years, and agreed upon by all stakeholders. The biodiversity vision statement serves as a touchstone for long-term conservation of the region's unique biological features. The vision gives the ideological basis and strategic directions for the ECP, while the PCAs provide the geographical basis for action. By agreeing on a far-reaching vision and the steps for achieving it, the conservation community can concentrate resources and efforts on the priorities that are most important for conserving the region's biodiversity. The biodiversity vision for the Caucasus Ecoregion was agreed upon by representatives of all six countries at a November 2002 regional workshop.

Priority Conservation Areas

To identify PCAs, model species for important taxon (plants, mammals, birds, amphibians, reptiles, and fish) were first determined and key sites for their protection delineated. Then, important areas for each taxon were determined. PCAs were selected in the next step, based on an analysis in which important taxon areas were overlaid and habitat representation was evaluated. Important corridors were identified to ensure connectivity among the selected PCAs. Next, GIS tools were used to analyze the existing protected areas network and highlight important gaps in the system, based on the important taxon areas and connecting corridors. Finally, the selected PCAs were ranked in terms of urgency and opportunity of conservation action (Map 2). Each of these steps is described in detail below.

Identifying model species for important taxon: In order to maintain viable populations of species in their natural communities, it is necessary to consider their specific area requirements. Due to limited resources, a subset of species – or models – was used as the focus of the analysis. By ensuring their conservation needs, many other species and their habitats would be accounted for. During the reconnaissance phase, 70 model species representing all major taxon (plants, mammals, birds, amphibians, reptiles, and fish) were selected to aid in identification of PCAs. In addition, experts identified and delineated (on a 1:500.000 scale map) the key ranges of distribution for each selected species within each country. Of these 70 model species, experts then nominated 26 priority species as focal species 1 for the Caucasus Ecoregion.

Selection of important taxon areas: experts designed maps of important taxon areas taking into account distribution and ranges of model species selected for each of the countries. In total, 260 important areas were identified as priorities for conservation of focal species and major taxa as a whole (60 for plants, 29 for mammals, 121 for birds, 28 for amphibians and reptiles, 22 for fish). While identification of important taxon areas was the basis for selection of PCAs, it also provides a framework for conservation efforts at the species and/or taxon level.

Selection of priority conservation areas: The important taxon areas were overlaid on a map and habitat representation evaluated. As a result of this analysis, 56 PCAs were selected as important for maintaining the unique biodiversity of the Caucasus Ecoregion (Map 2). The total area of identified PCAs equals 14 million hectares, covering about 24% of the Ecoregion's entire territory. Most of the PCAs coincide with mountain ranges, for example, 11 priority areas are in the Greater Caucasus, 19 in the Lesser Caucasus and South Caucasus Highlands, and two in the Talysh-Alborz Range. These large conservation areas were not delineated as blocks of natural habitats, which need to be protected in their entirety, but indicate important areas where urgent conservation measures are required. This may include

¹ Identified focal species for the Caucasus Ecoregion are: 11 mammal species/subspecies - leopard (*Panthera pardus saxicolor*), Striped hyena (*Hyaena hyaena*), brown bear (*Ursus arctos*), East and West Caucasian turs (*Capra cylindricornis*, *C. caucasica*), bezoar goat (*C. aegagrus*), Caucasian red deer (*Cervus elaphus maral*), Caucasian chamois (*Rupicapra rupicapra caucasica*), goitred gazelle (*Gazella subgutturosa*), Gmelin's (Armenian) mouflon (*Ovis ammon*), and European bison (*Bison bonasus*); 6 bird species - pygmy cormorant (*Phalacrocorax pygmeus*), Imperial Eagle (*Aquila heliaca*), Cinereous vulture (*Aegypius monachus*), Caucasian black grouse (*Tetrao mlokosiewiczii*), marbled duck (*Marmaronetta angustirostris*), and white-headed duck (*Oxyura leucocephala*); 2 amphibians - Caucasian salamander (*Mertensiella caucasica*) and Syrian spadefoot (*Pelobates syriacus*) and the 7 species of sturgeon - Russian sturgeon (*Acipenser gueldenstaedtii*), Persian sturgeon (*A. persicus*), bastard sturgeon (*A. nudiventris*), sterlet (*A. ruthenus*), star sturgeon (*A. stellatus*), Atlantic sturgeon (*A. sturio*), and beluga (*Huso huso*).

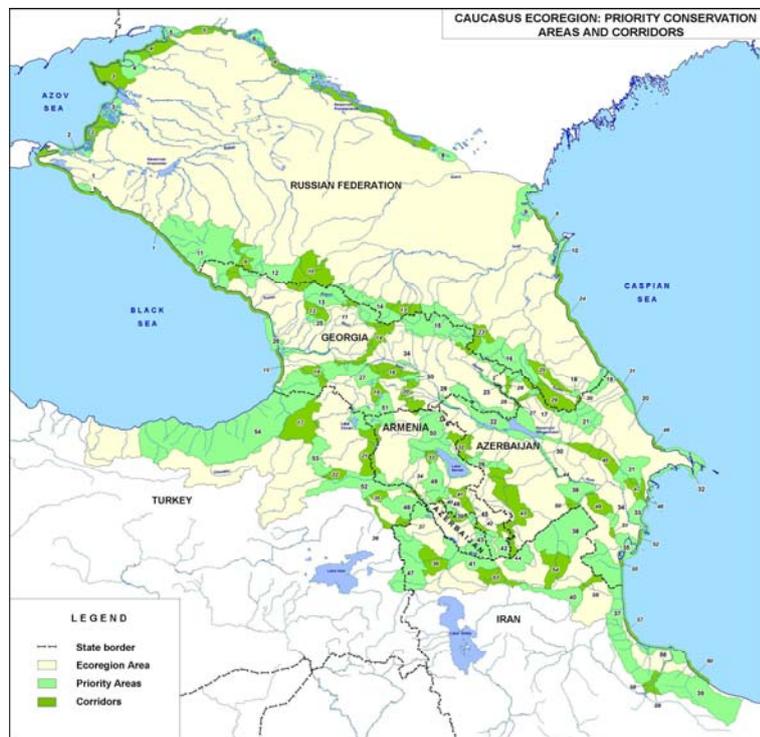
direct intervention: zoning for different forms of land-use (agriculture, industry, infrastructure development, and biodiversity conservation), planning of protected areas, identification of wildlife corridors, or definition of areas for natural resource use, as well as implementation of activities such as institutional strengthening, law enforcement and awareness building.

Gap analysis for protected areas: Next, PCAs were mapped with the existing protected area network to determine gaps in the system. In some cases, protected areas are not strategically placed from a biodiversity point of view or the specific protection category doesn't correspond to the actual conservation needs. This gap analysis aids in planning new protected areas in the region, as well as in determining where the protection category of existing sanctuaries needs to be increased.

Delineation of important corridors: large mammals, as well as birds, fish and other animals capable of migration need corridors for dispersal and to maintain viable populations by ensuring genetic exchange. Therefore, to guarantee the connectivity of the selected PCAs, experts identified 60 corridors (Map 2), keeping in mind the area requirements of migrating focal species, their population ecology and the spatial distribution of the existing protected area system. The corridors, covering relatively large territories (a total of 5,873,539 ha), were then taken into consideration, in definition of priority measures and projects for the ECP.

Vision Statement

The biodiversity vision statement was formulated, taking into account outcomes of the biodiversity and socio-economic assessments and considering long-term (50 years) objectives for conservation in the Caucasus Ecoregion.



Map 2: Priority conservation areas and Corridors

The Caucasus Ecoregion represents one of the most biologically rich temperate regions on Earth. The region contains an incredible diversity of ecosystems, including deserts,

temperate rain forests and alpine meadows. The Caucasus is well known for its high number of endemic species and unique evolutionary phenomena.

Our vision for the Caucasus is a region where healthy populations of native plants and animals flourish; habitats, landscapes and natural processes are preserved and where vibrant and diverse people actively participate in the equitable and sustainable management and use of natural resources.

The vision should be achieved using the following strategies:

- Organize a well managed protected area network across the Ecoregion
- Encourage collaborative management through involvement of all stakeholders, from national governments to NGOs and local communities
- Conserve and restore endangered species
- Promote transboundary cooperation
- Restore degraded ecosystems
- Harmonize legislative and policy frameworks
- Coordinate scientific research and monitoring across the Ecoregion, including indigenous knowledge and local communities
- Increase environmental education and raise public awareness on biodiversity conservation

Ecoregional Conservation Plan

ECP consists of 6 main sections and long- (20-years) and medium-term (10-years) targets, and proposed immediate actions (5-years targets). The main sections are: (A) Developing an Institutional Framework and Building Capacity for Biodiversity Conservation in the Caucasus Ecoregion; (B) Conservation and Sustainable Use of Forest Ecosystems; (C) Conservation and Sustainable Use of Freshwater Ecosystems; (D) Conservation and Sustainable Use of Coastal and Marine Ecosystems; (E) Conservation and Sustainable Use of High Mountain Ecosystems, and (F) Conservation of Focal Species and their Habitats. Biome sections are structured similarly – divided into “Conservation”, “Management” and “Restoration” sub-sections. Species section is mainly divided according to separate species or groups of species. Table 1 shows numbers of targets identified by experts in the context of the ECP.

Table 1 **Structure of ECP**

Section	Long-term target	Medium-term target	Immediate Action
Institutional	10	29	67
Forest	9	33	123
Freshwater	8	15	58
Coastal & Marine	9	22	52
High Mountain	7	15	60
Species	22	53	155
Total	65	167	515

Ecoregional Approach and International Conventions

An ecoregion is defined as ‘a relatively large unit of land or water, containing a geographically distinct assemblage of natural communities that share a large majority of their species, dynamics and environmental conditions’. Ecoregions are biogeographical entities, rather than political ones. An ecoregion is the product of thousands, or even millions of years of climatic and geological change and biological evolution. Ecoregion-based conservation recognizes the need to operate at a scale, large enough to achieve results that are ecologically viable: primarily by conserving a network of key sites, migration corridors, and the ecological processes that maintain healthy ecosystems. Ecoregion-based conservation does not ignore societal realities, however, as it also recognizes and addresses broad social, economic and political factors, that are among the root causes of biodiversity loss and that will determine long term success. Importantly, long-term conservation strategies developed under an ecoregional approach often lead to long-term funding opportunities needed to achieve sustainable development.

Global conventions provide coherent objectives and common management frameworks for the conservation of biodiversity and most of them recognise the need for regional approaches where ecosystems and species share resources between neighbouring countries. The CBD in particular is useful in providing a framework for regional cooperation, especially in minimizing negative transboundary ecosystem issues and in linking shared ecosystems within transboundary protected areas or by ecological corridors. Historically, most transnational agreements have focussed on management of specific resources – for example, fisheries, energy or water. Such agreements have rarely taken into account ecological functions or socio-economic differences between countries. Recently, however, a number of regional agreements have been achieved to manage some of the world’s river basins, seas and mountain systems – the Mekong River Basin, the Mediterranean Sea and the Alps being three cases in point. The countries of the Caucasus have already started to engage in regional cooperation to save biodiversity – for example, through the Caspian Environment Programme and the Asian Flyway Initiative (under the auspices of the CMS).

The Convention on Biodiversity (CBD)

As is well known, the objectives of the CBD focus on the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising from the use of genetic resources. All six countries in the Caucasus Ecoregion have signed up to this convention. The Conference of the Parties (CoP) has initiated (decision VI/26) a Strategic Plan. In the Strategic Plan’s mission statement, Parties committed themselves to a more effective, timely and coherent implementation of the Convention’s three objectives, in particular ‘to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level, as a contribution to poverty alleviation and to the benefit of all life on Earth’. This target, hereafter referred to as the 2010 Biodiversity Target, has obvious implications for the relevance and timeliness of the Caucasus ECP.

The CBD’s Strategic Plan’s framework includes seven focal areas, with goals and sub-targets and it identifies indicators for assessing progress on achieving the 2010 Biodiversity Target. Of particular relevance in that context is that at least 10% of each of the world’s ecological regions are effectively conserved (CBD Strategic Plan Target 1.1).

The CBD CoP has initiated programmes of work (PoW) on seven thematic work programmes including forest, inland waters, marine and coastal and mountain biodiversity. The actions identified for the four focal biomes of the Caucasus ECP are thus directly relevant to CBD's thematic work programmes. The CBD also has seventeen other programmes of work on cross-cutting issues such as protected areas, the ecosystem approach, access to genetic resources and benefit sharing, and traditional knowledge, innovations and practices. Again, measures to be taken identified by the Caucasus ECP would enable regional agencies to participate actively in these programmes of work.

The ECP is particularly well placed to assist the countries of the region implement the CBD's PoW on Protected Areas. The PoW includes four programme elements:

- direct actions for planning, establishing, strengthening and managing protected area systems and sites;
- governance, participation, equity and benefit sharing;
- enabling activities;
- standards, assessments and monitoring.

Each programme element has a number of goals, with time-bound targets and a range of suggested activities for Parties to undertake within a stated time period. Under Programme Element 1, Goal 1.1, for example, is "to establish and strengthen national and regional systems of protected areas, integrated into a global network as a contribution to globally agreed goals". Suggested activities by parties to meet the targets for this goal include establishing and expanding protected areas (as well as areas securing threatened species and marine and inland water ecosystems); promoting innovative types of protected area governance; and undertaking gap analysis. Goal 1.2 inter alia requires integrating protected areas into broader land- and seascapes and sectors, so as to maintain ecological structure and function by applying the ecosystem approach and the concept of ecological networks, including ecological corridors linking protected areas. Activities under this goal include undertaking ecological restoration where necessary. Goal 1.3 is "to establish and strengthen regional networks, transboundary protected areas and collaboration between neighbouring protected areas across national boundaries". Goal 1.4 requires Parties to substantially improve site-based protected area planning and management (including capacity building) and Goal 1.5 requires Parties to prevent and mitigate the negative impacts of key threats to protected areas (including alien invasive species and the wildlife trade). Goals under the other programme elements relate to benefit and equity sharing, providing an enabling policy, institutional and socio-economic environment for protected areas, capacity building, ensuring financial sustainability, communications and public awareness and monitoring and evaluation. The relevance of the ECP targets to the CBD Programmes of Works is indicated in Table 2.

The CBD CoP has adopted some principles to guide signatory States on implementation of the CBD. Of relevance here is the ecosystem approach, (the so-called Malawi Principles) which was adopted at the 5th CoP in 2000. The ecosystem approach is now considered a framework for the implementation of the convention. The CBD definition of the ecosystem approach is:

"...a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. Application of the

ecosystem approach will help to reach a balance of the three objectives of the Convention. An ecosystem approach is based on the application of appropriate scientific methodologies focussed on levels of biological organisation, which encompasses the essential structures, process functions and interactions among organisms and their environment. It recognises that humans, with their cultural diversity, are an integral part of many ecosystems.”

The CBD’s ecosystem approach and the ecoregional approach as exemplified by the ECP are thus strongly linked and mutually reinforcing, as an ecoregion is another ‘level of biological organisation where natural processes, functions and interactions occur’.

Finally, it is of relevance to note that the CBD’s CoP is actively seeking mechanisms for implementing the Convention at the regional level and the CBD Secretariat has been asked to compile information on regional mechanisms for CoP VIII in 2006. The ECP gives a unique opportunity to demonstrate the potential of regional cooperation, as a mechanism for biodiversity conservation.

Table 2 Relevance of ECP targets to CBD Programmes of Work (PoW)

CBD PoWs	Long-term target	Medium-term target
PoW Protected Areas	37	101
PoW Inland Water	9	12
PoW Marine & Coastal	9	22
PoW Forest	11	26

References

- Doluchanov, A.G. (1966). Vegetation. In: “The Caucasus”, chief editor I. P. Gerasimov: 223-255. Nauka, Moscow. (In Russian).
- Doluchanov, A.G., Nachutcrishvili, G. (2003). Hygrophile thermolhytische Laubmischwälder. – In: “Karte de natürlichen Vegetation Europas: Erläuterungstext”, zusammengestellt und bearbeitet von U. Bohn, G. Gollub, C. Hettwer, Z. Neuhäoslová, H. Schlüter, H. Weber (GIS): 384-388. Bundesamt für Naturschutz. Druck: LV Druck im Landwirtschaftsverlag GmbH, Münster-Hiltrup. Bonn, 2003.
- Mittermaier, R.A., Myers, N., Gil, P.G., Mittermaier, C.G. (1999). Hotspots: Earth’s biologically richest and most endangered terrestrial ecoregions”: 431 pp. CEMEX/Agrupacion Sierra Madre, Mexico City. Printed in Japan by Toppan Printing Co.
- Myers, N., Mittermeier, R. A., Mittermeier, C. G., da Fonseca, G. A. B. & Kent, J. (2000). Biodiversity hotspots for conservation priorities. – Nature, vol. 403, IUCN, Gland, Switzerland. Produced by Nature Conservation Bureau Limited, UK: 853-845.
- WWF (1997). Global 200 Ecoregions (The map).
- Zazanashvili, N., Gagnidze, R. & Nakhutsrishvili, G. (2000). Main types of vegetation zonation on the mountains of the Caucasus. – Acta Phytogeographica Suecica, 85: 7-16. Opulus Press, Uppsala.
- Zazanashvili, N., Sanadiradze, G., Bukhnikashvili, A. (1999). Caucasus - In: “Hotspots: Earth’s biologically richest and most endangered terrestrial ecoregions”, by R.A. Mittermaier, N. Myers, P.G. Gil, C.G. Mittermaier: 269-273. CEMEX/Agrupacion Sierra Madre, Mexico City. Printed in Japan by Toppan Printing Co.

Perspectives of Biodiversity

Possible Negative Effects of Expected Climate Changes in Azerbaijan on Biodiversity

Umayra Taghiyeva, Hydrometeorological forecasts bureau, Azerbaijan

It is known that as separate systems of our planet are in close unity, any changes that may occur in one system may effect directly or indirectly other systems as well.

Thus global climate change being one of the actual problems may cause creation of various complications. Since 1990 the global climate changes began to be treated as an important potential danger which may cause biological changes. According to world scholars it is accepted that negative effects of climate changes on ecosystems and natural processes may lead to desertification and annihilation of some species in some regions.

Evaluation of negative effects, the reduction of these effects and the conduction of scientific research for the purposes of preparation of adaptation measures from these points of view, are important problems faced by us.

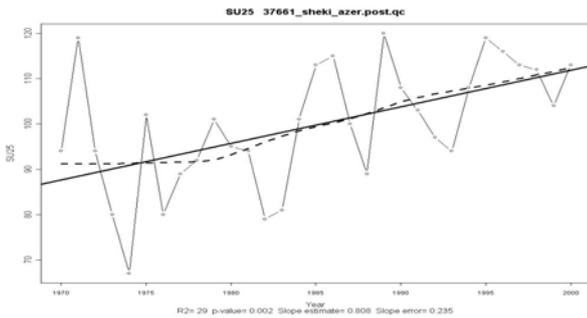
4.500 flora and 18.000 fauna species were defined in the region in connection with geological history and availability of various climatic conditions, due to Azerbaijan located in the crossing zone of mild and subtropic climatic conditions. Depending on the altitude and distance from the Caspian Sea the following climatic types are present:

- **Dry subtropics** – The Kura-Araz lowland and the Absheron peninsula
- **Wet subtropics** - Foothills regions of the Talysh Mountains and observed in the Lankaran lowland.
- **Mild** - specific for hills covered with forests on the Lesser and Greater Caucasus (this climatic type is divided in dry, mild-hot dry, mild-hot wet and mild cold climatic types)
- **Cold climatic type** – high mountainous areas of the Lesser and Greater Caucasus and climatic types observed in glaciers.

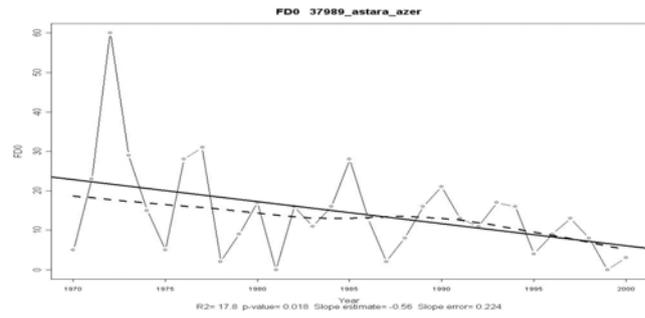
While evaluating effects of expected climatic changes (first of all the exact impressions on changes of climatic features should be created), information should be given on occurred changes. The results of trend analysis carried out, based on information of 16 representative meteorological stations of Azerbaijan during 100 years, shows that the temperature of the Republic had increased 0.5-0.6° C, while the atmospheric precipitations had changed less significantly.

The information of 30 years of hydro-meteorological stations from Sheki, Ganja, Yevlakh and Astara for the years 1970-2000 had been analyzed. It was defined that the number of the frosty nights and days decreased, and an increase in maximum temperature in days is noted (see charts).

The number of days with Tmax > 25°C



Number of days with Tmin<0C



Thus, we are already observing changes and it is expected, that such trends will be continued in future. Effects related to climatic changes will be reflected in an increase of temperature stresses. Temperature stresses show its negative effect on flora and fauna. According to the WMO the 90s are the hottest decades of the century. During the last decade of the last century the maximum and minimum temperature of the air was observed, as exceeding the noted limits in Azerbaijan too:

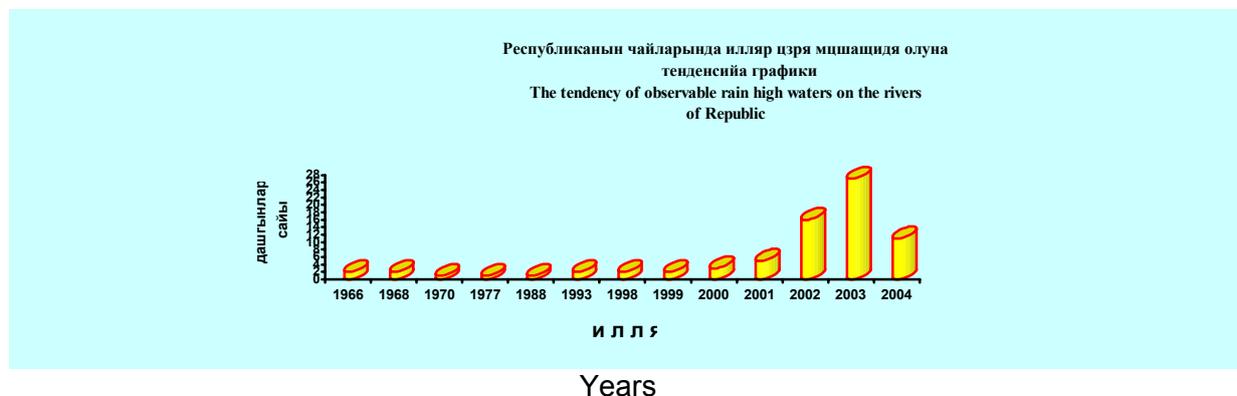
(•24.04.1997 – in Yevlakh 36°, •14.04.1998 - in Baku 31°, in Zardab, Kurdamir 38°, in Julfa, Goychay, Bilasuvar 37°, in Tartar 36°, in Agstafa 35° hot, on 15.07.200 - in Julfa 44°, on 09.2000 – in Julfa and Ordubad 46°, in Agstafa 41°, on 28.12.2002 - in Nakhichevan - 30° of frost).

The reduction of clear days and cold periods may create favourable conditions for plants. But an increase of temperature for some species and a decrease of water reserves may be dangerous. At the same time spread of plants' diseases and parasites towards poles may cause a decrease of agricultural plants' productivity.

Mudflow and floods

One of the factors, which may cause danger for biodiversity are natural disasters. As a result of analysis of statistic information, reiteration and multiplication of dangerous hydro meteorological cases in the territory of the Republic were noted.

Table: The tendency of observable rain waters on the rivers of the Republic



- The cases of mudflow and floods in Azerbaijan are mainly observed in the south and north-eastern hills of the Greater Caucasus, in rain basins of south–west and north-eastern foothills of Aside chain, Lesser Caucasus.

- Floods, mudflows occurred in Kishchay, Chinchay, Talachay, Kateckhchay, Kurmukchay in 1994-2003, have caused huge damages on the Azerbaijani economy.
- Mudflows were observed in some waters of Nakhichevan AR in July 1996. Many damages happen as results of these events annually.
- The catastrophic increase of water levels of the Kura and other rivers in spring-summer season of 2003, has caused huge damages to the economy of the Azerbaijan Republic to agriculture, as a result of flooding of cultivated areas and fishery economies.

Some changes are also visible in wind regime.

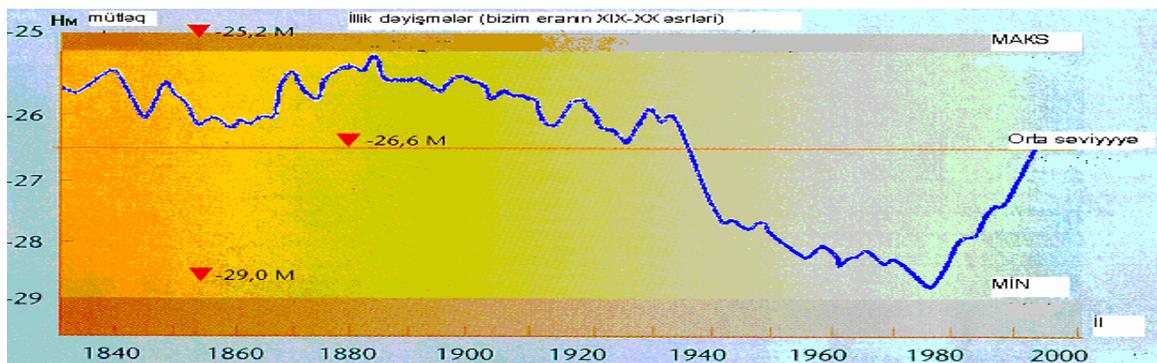
Strong wind

Meteorological features of the area along with the Kura River and along with the western coasts of the Caspian Sea create conditions for strengthening of western winds and as well eastern winds in Nakhichevan AR. The statistic analysis showed that there is a tendency of increase of strong windy (more than 25 meters per second) days in the territory of the Republic for the last ten years. Downpours with strong winds during spring season, cause a decrease of autumn cereals, as well as complicate flourishing of fruit trees and vineyards, which have negative effects on its productivity.

The vulnerability of coastal areas will lead to an increase of climatic changes.

Fluctuations of the Caspian Sea level

From 1978 to 1995, as a result of an increase of the Caspian Sea level by 2.5 meters, the coastal area of Azerbaijan as of 485 km² was subjected to flooding.



As a result of washing out, areas being under water and subjected to water flooding, an increase of allochod substances, like biogenic elements, organic substances, terrigenous, carbohydrates and heavy metals was observed, which create negative effects on the marine ecosystems. Results of modern research show, that if in 2040 the level of the Caspian Sea would increase for 150 cm from present level, 87.700 km² of coastal stripes of Azerbaijan would be subjected to flooding.

The expected rise of the level of the Caspian Sea will cause additional pollution with oil substances that will lead to a reduction of bio-resources and a degradation of some biocenosis in the flooded areas. Fluctuation of the hydrologic regime and the sea level is one of the factors that caused an increase of mine fishes. In connection with the rise of the sea level, the reproduction of fishes in rivers will be weakened. The quality of water in coastal

stripes will be worsened. In shallow waters of coastal stripes the caviar laying places will be changed towards worsening.

Durable drought

One of the expected complications of climatic change is related to droughts. According to the prognosis of scholars in some regions, humidity will increase, and in areas subjected to aridity, the duration of drought will be more durable and sharp. Risks related to food safety will show itself on a local and regional level. The long term drought has negative effects on biodiversity in water swamps and accelerates the process of desertification. Research conducted shows that the water reserves in rivers will decrease by 10-20% in Azerbaijan, due to the expected climatic changes. As a result, the energy sector, agriculture and supply of drinkable water will be the most vulnerable sectors of the economy.

It is furthermore expected that productivity and quality of pastures will decline, because of climatic changes, which will negatively impact the number of cattle and their condition.

Mountainous regions

The vulnerability of mountainous ecosystems to climate changes will increase. Expected decrease of glaciers and snow coverings will negatively impact soil and hydrologic systems' durability. (The warming will cause shortening of vegetation periods, due to fast growing of cultural plants; this can cause an expansion of vine yards in mid foothills).

The analysis conducted shows that the main complication of climate changes in Azerbaijan is worsening of natural humidifying conditions, which might cause significant change of inner structure of bio- and phytocoenosis habitat areas and natural ecosystems.

The expected warming will accelerate the reduction of natural humidifying and the increase of desertification processes. It will also cause the acceleration of these processes in areas subjected to salinisation and erosion, the change of boundaries of forest ecosystems, the replacement of mesophile plants with drought-enduring plants, the worsening of soils' surface's physical and chemical structure and content.

It is expected that high temperature boundaries will lead to stress features of cultural plants and multiplication of days with dangerous observed drought. At the same time climate changes will positively effect the development of alpine and sub-alpine complexes. Coastal areas ecosystems will also be vulnerable to climate changes.

Despite there are some uncertainties in future forecasting the conducted surveys show that the expected climatic changes in Azerbaijan will mainly cause serious complications in:

- subjection of Caspian coastal areas to flooding, facing of danger by rare and valuable coastal areas,
- degradation of soils,
- increase of negative effects on human health,
- sharpening of negative effects on ecosystems and especially on biodiversity,
- reduction of water reserves,
- negative effect on forest reserves,
- effects in agricultural areas.

Hence, the observation of rapid effects of climate changes increases the necessity of the preparation of adaptation measures and their implementation. During the preparation of adaptation methods and their implementation it is necessary to integrate the relevant Ministries and organizations and interested parties and to apply at the same time, international experience in this field. As species and ecosystems are to move on “vertical” line, there is no place for migration of species inhabiting mountain peaks and they are doomed to extinct. Observations show that the areas of current glaciers had been reduced for 30%.

Forest areas

It is expected that forest areas are most vulnerable to climate changes:

- As a result of man made factors and climate change, forests' unity will be destroyed and an increase of current zone forest degradation related to spoilage and heating, movement of forest natural habitat towards higher areas, change of gender and productivity are expected.
- According to prognosis as the result of climate change oak and hornbeam in upper parts of middle mountainous zones, pistachio trees, oak and hornbeam tree kinds will be kept.
- 2-3% of hard leaf and oak forests, 15% of pistachio forests are expected to be reduced, and 19% of hornbeam forests are expected to increase. 20% of soft leaf forests, 12% of other trees and 70% of bushes will increase.
- The role of forests increases in connection with climate change. Whatever effect forests have on climatic factors, climatic factors in turn effect forests. For example, forest trees decrease carbon gas in the air, as a result of assimilation.
- The calculations show that 3% of carbon gas stock in the air is absorbed annually as a result of assimilation. At the same time forests are one of the suppliers of carbon gas in the air.
- In order to remove problems in the forest sector and provide development of forests the “National programme on restoration and growth of forests in AR” was adopted in 2003 and according to it, the Ministry of Ecology and Natural Resources had restored 22.000 hectares of forests and had completed the afforestation of 11.000 hectares of forests.

In this field there is potential for participation of Azerbaijan in the Kyoto Protocol Clean Development Mechanism and at the same time in reforestation and afforestation as being components of the biodiversity mechanism (Carbon Sink).

Summary

As a result of the evaluation of climate changes in Azerbaijan, it was defined that at double increase of CO₂ carbon gas in the air, the average annual temperature will increase by 4.11-5.87°C or 2°C by other estimates. Atmospheric precipitations will be stable or go down below norm. According to the estimates, water reserves will be reduced by 10-15% and this will cause shortages of water reserves.

From Nature to Agrobiodiversity

Urmas Tartes, Estonian Agricultural University, Institute of Agricultural and Environmental Sciences, Estonia

Introduction

According to the Convention on Biological Diversity, biodiversity includes the variability among living organisms and ecosystems from all sources. Diversity at all organizational levels, ranging from genetic diversity within populations to the diversity of ecosystems in landscapes, contributes to global biodiversity. Nevertheless, the main focus has so far been on natural species diversity, because the causes, patterns, and consequences of changes in diversity at this level are relatively well documented. Taking into account the number of endemic species, 25 biodiversity hotspots, including the Caucasus region, have been revealed in the world. Besides endemic species, as many as 44% of all species of vascular plants and 35% of all species in four vertebrate groups are confined to these hotspots (Myers, et al., 2000).

Industrial agriculture has had an enormous impact on the landscapes and nature and is one great cause of today's global problems. Feeding such a large human population has inevitably led to many areas of land being cleared and native ecosystems replaced by introduced and/or cultivated species. This has considerably lowered the value of biodiversity. Extensive stands of non-native species may produce high yields, but they are virtual deserts in biodiversity terms, as few native species can use them as suitable habitats. Intensification, abandonment and scale of operation are the keywords leading to conflicts between agriculture and biodiversity (Niemi, et al., 2003, and Young, et al., 2004). Nevertheless, sustainable agriculture can both, depend on, benefit and support many different and diverse ecosystems and we have to be aware of declining agrobiodiversity, as we have to take care of "natural" diversity. Although agrobiodiversity has been somewhat less visible in public, debates about the loss of agrobiodiversity are steadily developing. In the context of the Convention on Biological Diversity, agrobiodiversity was addressed from 1996 onwards (Wolff, 2004).

Ecosystem services

To analyze the importance of agrobiodiversity, let us ask a well understandable utilitarian question: why one should need the biodiversity? The answer is simple: all ecosystems provide us with services which are the processes and conditions of ecosystems supporting human activity and sustaining human life. To give just few examples, such services include the maintenance of soil fertility, climate regulation, and natural pest control and provide flows of ecosystem goods such as food, timber and fresh water. They also provide intangible benefits, such as aesthetic and cultural values. Some of these services are direct, others are indirect. But biodiversity is not separable from human welfare and well-being. There is a consensus that at least a minimum number of species is essential for an ecosystem to function under constant conditions and that a larger number of species is probably essential for maintaining the stability of ecosystem processes in changing environments (Loreau, et al., 2001).

As a rule, the stronger the human impact is to the ecosystems, the more direct services it provides and vice versa. Depending on human influence, we have several interconnected

ecosystems: natural ecosystems ↔ seminatural ↔ agroecosystems ↔ urban ecosystems. Urban ecosystems and agroecosystems carry more direct services and have correspondingly strongest human impact, while natural and seminatural ecosystems carry more indirect services and have least human impact. An integral part of agricultural intensification at the plot level is the deliberate reduction of diversity. This does not necessarily result in impairment of ecosystem services of direct relevance to the land user, unless the hypothesized diversity–function threshold is breached, by elimination of a key functional group or species (Swift, et al., 2004). Often human (agricultural) activities may surprisingly lead to beneficial influence on biodiversity, both on natural and agricultural scale.

Agrobiodiversity loss

The term agrobiodiversity has evolved only in recent years in the wake of the general biodiversity discourse. Analogous to the term biodiversity, agrobiodiversity encompasses different levels, relating to the diversity of agroecosystems, as well as that of species of crops and farm animals and to the genetic variance within populations, varieties and races. In its broadest sense, agrobiodiversity also comprises soil organisms in cultivated areas, insects, and fungi that promote good production, wild species from off-farm natural habitats as well as cultural and local knowledge of diversity and management forms, as the basis of the exploitation of diversity.

Like natural diversity, diversity of domesticated crops is not uniformly distributed around the world. It tended to be found in certain areas, which typically shared certain geographic characteristics and a history of ancient settlement and agricultural practices. These are usually the primary centres of in situ diversity for that crop and continued gene flow between crops and their wild relatives in these areas can contribute to new variability. The history of the exchange of genetic resources between different regions has led to the development of important secondary centres of diversity for many crop species. Significant diversity in varieties of the crops has evolved and been developed in regions, other than the origin of the crop itself (FAO, 2000).

Diversity of different breeds and cultivated plants is decreasing even much quicker than natural biodiversity. The modern form of agriculture is particularly characterized by its strive to achieve the largest possible short-term profit on the available area and correspondingly results in negative ecological effects. These include the loss of genetic diversity both for crops and animal production and the loss of biodiversity through the input of high doses of fertilizers and biocides, landscape clearing, and the conversion of natural landscapes into fields and intensively used pastures. Almost everywhere in the world, up to 95% different crop varieties have been lost during the last century. World nutrition today is mainly based on a mere ten main crops, and only 30 crops provide 95% of dietary energy or protein (FAO, 2000). The decreased genetic diversity, simplification of the ecosystem and, in particular, the use of broad-spectrum pesticides also decreases the diversity of natural enemies and increases risks of pest attack (Swift, 2004). It means that we need only 2-3 “super bugs” to wipe out large uniform crop fields worldwide.

Agriculture and biodiversity

Sustainable agricultural activities can lead to a substantial increase of natural biodiversity. Seminatural communities, particularly grasslands, are the most important habitats for biodiversity in agricultural landscapes. Used as a source for forage and fodder to livestock,

close relations exist between seminatural communities and human activities with diversity, coverage, and ecological conditions of meadow vegetation, directly linked to economic activities and prevailing socioeconomic systems (Young, et al., 2004). For example, 76 vascular plant species per square meter can be found in Laelatu wooded meadow (Estonia, personal communication). Simultaneously many other old agricultural landscapes, extensively used vineyards, orchards, and old fields are of considerable importance for a range of species, including many that have become very rare (Niemelä, et al., 2003).

Importance of local knowledge

Environmental changes affect people globally and locally. Yet, international scientific assessments often ignore the vast knowledge and expertise of local and indigenous people. This ranges from detailed records of species diversity to stories of species migration and weather patterns that are passed down through village elders, hunters, and farmers.

The fact, that agrobiodiversity and traditional farming systems are important locally, is no longer in question, but their importance for the long-term sustainability of the global food system is less acknowledged. The advantages of these local crops over those that currently dominate world agriculture - their nutritional and health qualities, medicinal potential, tolerance of drought and other climate extremes, and non-reliance on fertilizers and other inputs, for example - will have more significance as climate change, population growth, and urbanisation shape the future world. Conserving, documenting and promoting dynamic use of local crops require scientists and farmers to work together, so that these neglected crops are no longer marginalised but are given the attention they deserve.

Ecosystem approach

The ecological consequences of biodiversity loss have aroused considerable interest and controversy during the past decade. Major advances have been made in describing the relationship between species diversity and ecosystem processes, in identifying functionally important species and in revealing underlying mechanisms. There is, however, uncertainty about how results obtained in recent experiments scale up to landscape and regional levels and generalize across ecosystem types and processes (Loreau, 2001, Swift, 2004). Larger numbers of species are probably needed to reduce temporal variability in ecosystem processes in changing environments. A major future challenge is to determine how biodiversity dynamics, ecosystem processes and abiotic factors interact. To reach our target, a significant reduction of the current rate of biodiversity loss, we have fully embrace the ecosystem approach (Secretariat of the Convention on Biological Diversity, 2004) in all activities, aimed at the conservation and sustainable use of biological diversity, both in natural and agroecosystems.

References

- Convention on Biological Diversity, Rio de Janeiro, 1992
- FAO, 2000. State of the World's Plant Genetic Resources for Food and Agriculture. <http://www.fao.org/>
- Loreau, M., Naeem, S., Inchausti, P., Bengtsson, J., Grime, J., P., Hector, A., Hooper, D., U., Huston, M. A., Raffaelli, D., Schmid, B., Tilman, D., Wardle, D., A. 2001. Biodiversity and Ecosystem Functioning: Current Knowledge and Future Challenges. *Science*, 294, 804-808.

- Myers, N., Mittermeier, R., A., Mittermeier, C., G., da Fonseca, G., A., B., Kent, J., 2000. Biodiversity hotspots for conservation priorities. *Nature* 403, 853 - 858.
- Niemelä, J., Askasibar, M., Kurttila, M., Larsson, T.-B., Paiva, R., Portoghesi, L. Smulders, R., Stevenson, A., Tartes, U., Watt, A. 2003. Porests. In: Watt, A.; Nowicki, P.; Alard, D.; Henle, K.; Johnson, R.; Matouch, S.; Niemela, J.; Young, J. (eds.) 2003. Conflicts between human activities and the conservation of biodiversity in agricultural landscapes, grasslands, forests, wetlands and uplands in Europe. A Report of the Bio Forum project "European Biodiversity Forum - Implementing the Ecosystem Approach", pp 170.
- Secretariat of the Convention on Biological Diversity, 2004. The Ecosystem Approach, (CBD Guidelines) Montreal: Secretariat of the Convention on Biological Diversity 50 p.
- Swift, M. J., Izac, A.-M., N., van Noordwijk, M. 2004. Biodiversity and ecosystem services in agricultural landscapes - are we asking the right questions? *Agriculture, Ecosystems and Environment*, 104, 113-134.
- Young, J., Halada, L., Kull, T., Kuzniar, A., Tartes, U., Uzunov, Y., Watt, A. (Eds.) 2004. Conflicts between human activities and the conservation of biodiversity in agricultural landscapes, grasslands, forests, wetlands and uplands in the Accessing and Candidate Countries (ACC). A Report of the Bio Forum project "European Biodiversity Forum - Implementing the Ecosystem Approach", pp 97.
- Wolff, F., 2004. Legal factors driving agrobiodiversity loss. *Environmental Law Network International*, 1/2004

International Experience of Biodiversity Protection and Use

Biological Diversity of Turkey

Mustafa Kemal Yalinkiliç, Nature Protection and National Parks, Focal Point on Biodiversity, Turkey

Arzu Olgun, Turkish Scientific and Technical Research Council Marmara Research Centre, Chemistry and Environment Institute, Turkey

Turkey is described as a bridge between Europe, Asia and Africa. The differentiation of the topographic structure and climatic conditions of Turkey has resulted in a great variety of natural habitats, from sand dunes and arid steppes to alluvial plains, lakes, and rivers. At the same time, its mountainous and varied topography, including seas, Istanbul and Çanakkale Straits, makes it as much barrier as bridge. Turkish flora includes many wild relatives and genetic diversity of important domestic species (e.g. wheat, chickpea, lentil, apple, pear, apricot, chestnut, and pistachio). Turkey is also home to a number of ornamental flowers, the most notable being the tulip. Among continental countries Turkey ranks 9th in terms of biodiversity richness with over 33% of its flora being endemic. From this perspective:

- Turkey has 75% of the total 12.000 plant species found in the whole of Europe. Turkey has also 3.000 endemic plant species, which forms 1/3 of its flora.
- Due to the location among Europe, Asia and Africa, surrounding of the three sides with different ecological seas, high altitude differences, such as 5.000 meters above sea level; 132 mammal, 453 bird, 106 reptile and 345 fish species live in Turkey.
- The wetlands of Turkey have a vital importance for most of the immigrant birds and it is also the breeding area for most of the water birds.
- Two main migration routes of Western Pale arctic Region are located in Turkey.

Anatolia is similarly rich in fauna, with over 80.000 species. It is the original homeland for the fallow deer and the pheasant. Lions, tigers and leopards once prowled freely across the Anatolian steppe. Today, the mountains and national parks are still abound with wildlife, such as brown bears, wild boar, lynx, wolves, the occasional leopard and over 400 species of birds, several of them endangered.

Basic legislative framework for biodiversity in Turkey

The legal status of biological diversity in Turkey is reflected in the legal documents, such as the Constitution, Laws, International Conventions, Protocols and Related Regulations. There are 35 laws, 3 decrees of law status, 23 regulations, and 10 circulars related to environmental issues, including the Law for Environment, Law on the Conservation of the Cultural and Natural Heritage and National Parks Law's passed in 1983. Many are directly or indirectly related to biological diversity, including Hunting Law, passed in 1937 that brings the concept of protection of endangered species for the first time to legislation

- National Parks Law (1983)
- Decree on Specially Protected Areas (1988)
- Law on Protection of Natural and Cultural Assessments (1983)
- Law on Environment (1983)
- Regulation on Wetland Protection (2002)

- Terrestrial Hunting Law (1937)
- Aquatic Products Law (1971)
- Forestry Law (1956)
- International Conventions: CITES, Bern, RAMSAR, Convention on Biological Diversity, Barcelona, Combating Erosion, etc.

Protected area status in Turkey:

1. National Park
2. Nature Conservation Area
3. Nature Park
4. Natural Monument
5. Ramsar Site
6. Wildlife Conservation Site
7. Recreation Areas
8. Specially Protected Areas

A National Park is a natural area, from scientific and aesthetic point, having both natural and cultural values of rare national and international standing and natural and recreational sites. At the present, there are 36 national parks established in Turkey.

A Nature Conservation Area is a natural area designated to be used only for scientific and educational purposes, containing rare, threatened or endangered ecosystems and/or species and outstanding samples brought about by natural phenomena and which should definitely be protected.

A Nature Park is a natural area, containing characteristic vegetation and wildlife features and is suitable for recreation activities and repose of public in its scenic wholeness.

A Natural Monument is a natural area, having the characteristics and scientific values brought about by nature or natural phenomena and being protected within the framework of the principles on national parks.

A Wildlife Reserve Area is a natural area, which is reserved in order to protect the wild animals whose populations are decreasing, in their natural environments with their habitats without influencing the ecosystem characteristics. There are 88 Wildlife Reserve Areas throughout Turkey.

Biogenetic Reserve Areas are the areas exhibiting rare or endangered habitats, unique ecosystems, protected by legislative status on the national level. There are two main purposes of establishing biogenetic reserves: 1) to keep biological balance under control, to conserve and maintain genetic diversity and representation of different types of habitats and ecosystems; 2) to make biogenetic reserve ecosystems suitable for biologic studies.

Specially Protected Areas are the areas with great natural beauty, historical value and tourism potential. Specially protected areas are set aside to protect the environmental and historical values by regulating housing and touristy developments. With the requirements of the Article Nr. 9 of the Environmental Law (Code Nr. 2872), fourteen Specially Protected Areas with historic and cultural values in different parts of the country have been set up so

far. The Authority for Specially Protected Area in the Ministry of Environment and Forestry is responsible to protect these areas, as well as to prevent unregulated housing and other constructions.

Recreational Areas in forests are identified and established from the forest areas that have recreational and resource values and service units are constructed for the people to have regular picnic and camping activities.

Table Protected Areas in Turkey

PROTECTION STATUS	NUMBER OF AREAS	TOTAL AREA (ha)	RELATED LAW
NATIONAL PARK	36	808.172	NATIONAL PARKS LAW (2873)
NATURE RESERVE AREA	34	81.861	NATIONAL PARKS LAW (2873)
NATURE MONUMENT	102	5285	NATIONAL PARKS LAW (2873)
NATURAL PARKS	17	69.505	NATIONAL PARKS LAW (2873)
WILD LIFE RESERVE AREAS	88	1.400.000	HUNTING LAW (4915)
PROTECTED FOREST	54	365.787	FOREST LAW (6831)
GENETIC RESERVE AREA	193	27.735	FOREST LAW (6831)
SEED GARDENS	338	46.086	FOREST LAW (6831)
SPECIALLY PROTECTED AREAS	14	1.200.223	ENVIRONMENT LAW (2872)
NATURE SITES	-	-	CULTURAL AND NATURAL ASSESSMENT LAW (2863)
RAMSAR SITES	12	180.000	RAMSAR CONVENTION

International conventions and protocols ratified by Turkey

Turkey is party to all conventions on nature protection below:

- Convention on Biological Conservation (1997)
- Cartagena Protocol (2004)
- CITES (1996)
- Barcelona Convention (1988)
- Bucharest Convention (1994)
- Protection of Cultural and National Heritage (1983)
- Convention on Combating Erosion (1998)
- European Landscape Convention (2000)
- Bern (1984)
- Ramsar (1994)

Convention on Biological Diversity

Objectives: The conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including access to genetic resources and transfer of relevant technologies and taking into account all rights over those resources and to technologies

Decision bodies: - Conference of Parties
 - Subsidiary Body on Scientific,
 - Technical and Technological Advice

Position of Turkey: Turkey signed the Convention at Rio de Janeiro on June 11, 1992 and ratified it on February 14, 1996 and it was entered into force in Turkey on May 14, 1997.

Cartagena Protocol on Biosafety

Under the Convention Cartagena Biosafety Protocol was prepared and adopted, a supplementary agreement to the Convention. Turkey signed the protocol on May 24, 2000 and entered into force on January 24, 2004.

Carrying out National Activities for implementation of the Convention

- The National Biological Diversity Strategies and an Action Plan has been prepared.
- The National biodiversity Clearing House Mechanisms has been established.
- A GEF Project, called In-situ Conservation of Plant Genetic Resources had been implemented and identified important in-situ conservation areas for plant genetic resource in Turkey that are called as Genetic Resources Conservation and Management Areas.
- The In-situ Conservation National plan on Plant Genetic Resources and the draft Regulations, regarding Genetic Resources Conservation and Management Areas have been prepared.
- By coordination of the State Planning Organization, Biological Diversity Conservation and Sustainable use concept to be integrate into sectoral plans and programmes and sustainable development plans.
- Translation of the Convention text into Turkish and published both Convention text in Turkish and English as a guide book.
- A GEF II project, as called Biological Diversity and Natural Resources Management has already been implemented.
- Different biological diversity projects have been carried out by various institutions and Ministries at national level and regional level.

The new GEF project has been prepared as called "Biological Diversity"

- The project has been submitted through UNEP to GEF, nowadays the project is at an approval stage.

- The project aims to develop National Plan, Strengthened National Clearing House Mechanisms and reviewing the
- National Biodiversity Strategy and Action Plan.

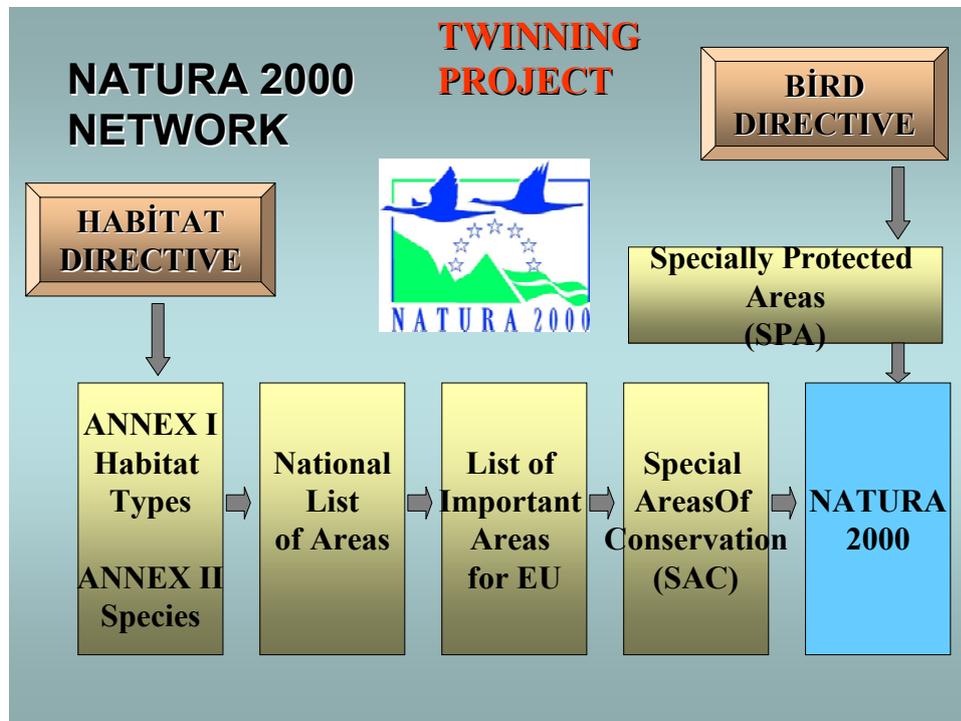
Internationally Supported Projects

The Twinning project for capacity building in the field of Environment in Turkey – Nature Component

The objective of the project is to provide implementation of the following relevant EU Directives:

- Conservation of Natural Habitats of Wild Flora and Fauna Directive (92/43/EEC)
- Conservation of Wild Birds Directive (79/409/EEC)
- Protection of Species of Wild Flora & Fauna by Regulating Trade (Regulation EC/338/97 etc);

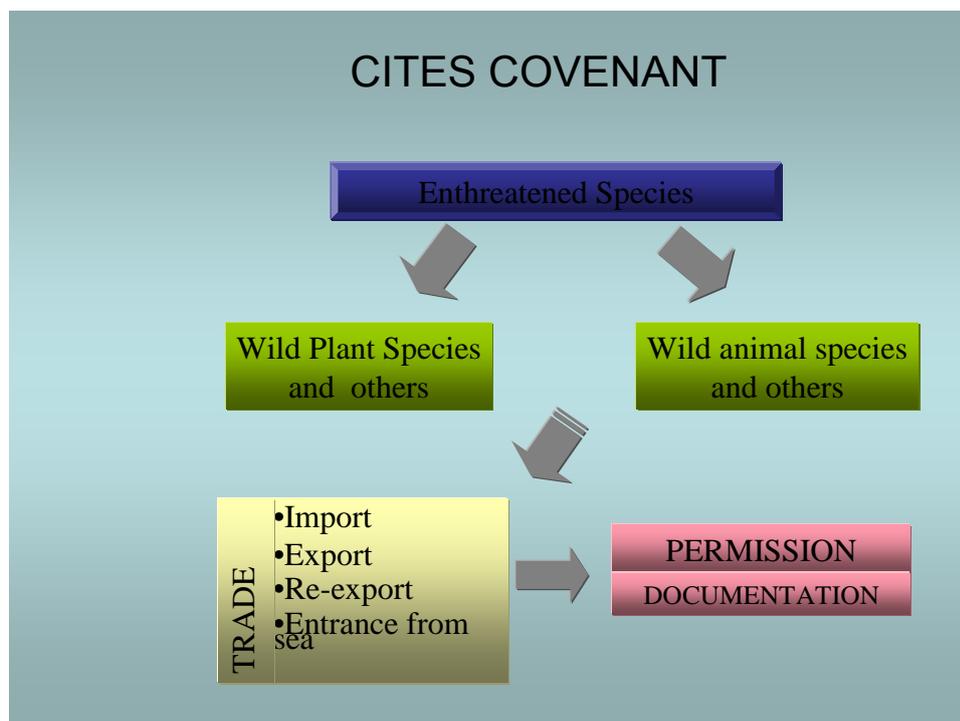
Timeframe of the project: 2 years (March 2004-July 2006)



TWINNING PROJECT

Sub-project I – Implementation of the Birds Directive and the Habitats Directive

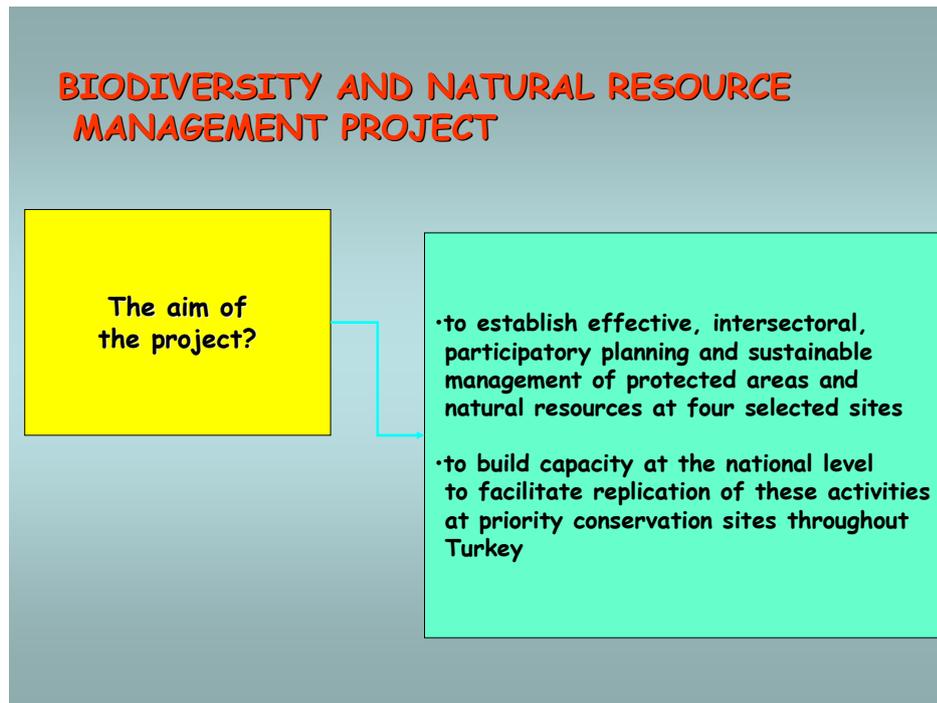
- Technical assistance and initial detailed assessment for managing nature protection in Turkey
- Multi-purpose digital classification of Turkey, using CORINE Land Cover classification
- Compilation of a harmonised national database of species and habitats
- Assessment and scientific review of existing information about relevant habitats, according to Annex I of the Habitats Directive
- Assessment and scientific review of existing information about relevant bird species
- Assessment and scientific review of existing information about relevant species according to Annex II, IV and V of the Habitats Directive and the CITES regulation
- Pilot study in two protected areas to apply the EUNIS Habitat Classification to existing protected areas in Turkey
- Detailed review of habitats in Turkey to propose habitat types that should be added to the Habitats Directive (Annex I)
- Detailed review of bird species in Turkey to propose species that should be added to the Birds Directive
- Detailed review of species in Turkey to propose species that should be added to the Habitats Directive
- Review of all existing protected areas to propose a list of potential SPAs and SACs
- Detailed study to identify other possible candidate areas to propose a list of potential SPAs and SACs
- Feasibility study on the need for upgrading existing and/or building new animal rescue centres
- Feasibility study on future needs for further effective implementation of CITES.



A Biodiversity and natural resource management project

Prepared and carried out by the Ministry of Environment and Forestry in collaboration with the World Bank and financed by the Global Environment Facility (GEF) was launched in August 2000 with the signature of the Treasury of the Prime Ministry and the World Bank, and it will last in 2006.

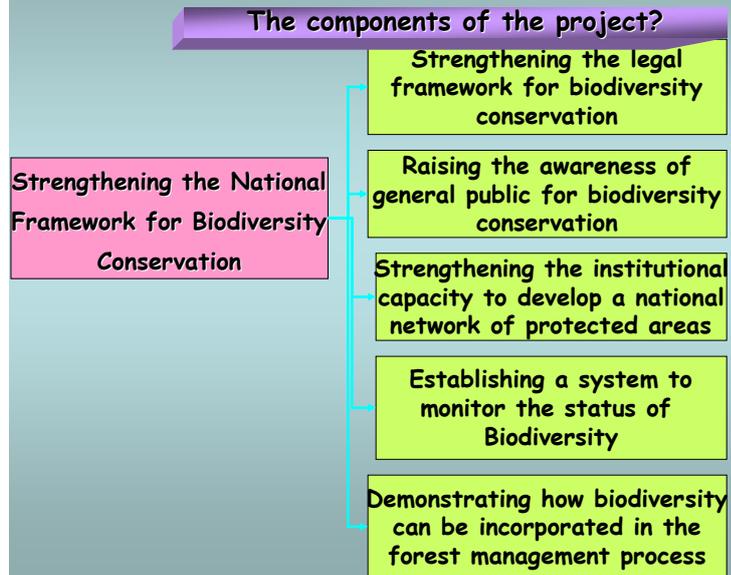
The total budget of the project is US \$ 11.5 million, of which US \$ 8.2 million is from GEF Grant Contribution and US \$ 3.2 million is Government Contribution.



Project sites were selected by the Turkish Biodiversity Steering Committee since they have international importance and represent the four main biogeographic zones of Turkey. These project sites are:

- Artvin-Camili Caucasian Mixed Temperate Rain Forest and High Alpine Meadows
- Kayseri-Sultansazlığı Nature Reserve Area, Wetland and Steppe Ecosystems
- Antalya-Köprülü Kanyon National Park, Taurus Mountains, Mediterranean Forest and High Alpine Ecosystems
- Kırklareli-İğneada Alluvial Forest with Associated Aquatic and Coastal Ecosystems.

BIODIVERSITY AND NATURAL RESOURCE MANAGEMENT PROJECT



Central Asia as an Example of International Nature Conservation and Sustainable Regional Development

Gila Altmann, Former State Secretary Ministry of Environment, Nature Conservation and Nuclear Safety, Germany

The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes and, increasingly, by the influence of humans. It forms the web of life of which we are an integral part and upon which we so fully depend. The Convention on Biological Diversity establishes three main goals: “the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources”.

Resources are not distributed evenly around the world. Some regions possess a great biodiversity, mineral resources and cultural treasures, but at the same time their people live in great poverty because of a profound lack of infrastructure. The lack of water, energy and land, as well as the exploitation of resources by third parties, lead to a growing competition for the few resources that are available. This conflict would not only affect nature, but it would also destabilize social structures.

Any unsustainable use of resources contributes to the growing shortage and destruction of resources and the aggravation of structural poverty. Experts forecast that the global climate change will intensify the effects of floods and draughts and is going to cause migration of people, which will seriously overstrain all available state capacities. Apart from social conflicts, it generates violent hostilities and impoverishment.

We all bear responsibility for the protection of the global environment, as well within the CBD as within other conventions. But in addition to this, we also have to see and acknowledge the need and the right for economic and socio-cultural development, especially in remote areas. In its report „Fighting Impoverishment through Environmental Politics”, the German WBGU (scientific advisory board for ecological questions) states that in large parts of the world the inhabitants’ existence is already endangered by diversification and degradation. Uncontrolled processes of urbanization, the industrial forest destruction followed or accompanied by natural disasters, result in the lack of clean water or water in general, degradation of the environment and the loss of biodiversity. The UNDP has assessed the damages globally and comes to the conclusion that these societies are in serious danger. Three quarters of the hundred biggest cities in the world are situated in such regions. Especially poor people are the victims of such developments, because they do not have the means and opportunities to either cope with or adapt to such problems. In this respect, we are not only talking about minimal incomes but also about the lack or loss of property rights and rights of disposal, social participation and access to resources. This often includes bio-piracy and the lack of multi-lateral structures to guarantee a fair compensation between the industrial and the developing countries.

Nature conservation aims at a regional development in harmony with nature; besides the classical conservation aspects, however, it also has to involve the people who make their livings from this natural environment and it needs to ensure their participation at the regional level. Within the framework of its program “Man and the Biosphere”, the UNESCO has

designated a number of biosphere territories. These areas may serve as trend setting examples of how planning instruments for a sustainable regional development can be successful. Because all the processes require manifold joint consultations at different levels, they open great opportunities to discuss common visions and projects of the future. This applies even more if these are transboundary processes. On the basis of communication, the parties can create an atmosphere of trust and understanding that can go beyond the aims and measures of nature conservation and can also have positive effects on the relationships in general.

The key question is: Is there an instrument that can be used to reconcile the conservation of biodiversity, while allowing the quest for economic and social development and the maintenance of cultural values? There is, if certain conditions are met:

- a) All parties of the region involved in the process have to support the process on all structural and political levels;
- b) The political decision-makers at the national level must have agreed to this process;
- c) The process has to be in line with the strategy of the international community of states;
- d) Suitable financial instruments have to be available;
- e) It must be clear that this process is going to take time, but will then develop a momentum of its own.

The German Ministry of Environment and the Federal Agency for Nature Conservation have been working on a very ambitious project in the Altai region for approximately five years. They have been actively supported by the Ministry for International Collaboration/Organisation of Technical Collaboration, the GTZ and the Ministry for Foreign Affairs.

The leading questions regarding the Altai region were:

1. What does a region qualify to become a model region?
 - a) Which ecological potential must be available?
 - b) What are the issues regarding this region?
2. Does the region have the necessary framework with regard to the biological, socio-cultural and political setting?
3. What is the global and international interest in this region?

Some facts about this region:

The Altai Mountains are located in the border region of China, Russia, Mongolia and Kazakhstan; inhabited by 500.000 people, living on a territory of 150.000 km².

The population is a mixture of long-established Altaians, Kazakhians, Mongolians and Tunisians, as well as of Russians, Germans and Chinese, who have moved there not too long ago. The majority of the population are cattle-breeders and they are poor, due to the lack of basic infrastructure, they would need to market their products. The previous mining of natural resources has come to a halt and there are no approaches to develop this unique region.

At the same time, this area represents an important and original centre of biodiversity of mountain plants and animal species in northern Asia, a large number of which are rare and endemic. For this reason, the Altai is among the 25 so called hot spots of biodiversity in the world. The biological richness and productivity of this region is outstanding and therefore, with full justification, a prior aim of worldwide protecting efforts. Apart from that, the area is populated by a historically unique ethnic and religious diversity among its nomad peoples, which date back several hundreds years before Christ.

This part of Central Asia possesses natural resources like oil, gas and minerals, but it also has to cope with nuclear waste. Historically, there have been some conflicts in the relationships between the younger and elder population within some tribes. Problems are emerging regionally, due to misuse of water resources, e.g. of the Tien Chan, overgrazing and excessive hunting of big game.

We can observe here, as everywhere else in the world, the conflict of diverse interests:

On the one hand, the aim is economic integration, including comprehensive industrial development. On the other hand, one tries to avoid the loss of natural and ethnic-cultural diversity, by establishing a development based on sustainable local forces and players. To solve this antagonism and to find a satisfying compromise for all participants, in the 2. Conference for Strategic Development of Central Asia (CoDoCA), which was held in Rum (China, Xingjian) in September 1998, a Protocol of Intentions was signed. The aim is to establish a UNESCO biosphere territory within the entire region as a first step towards the Convention. At the beginning, there were a lot of doubts in terms of feasibility, and it sometimes seemed to be nearly impossible to reconcile to the objectives which only at first glance seem to be contradictory. Yet, the region is provided with preconditions you could tie in, such as:

- major approved conservation areas, two of which belonged to the UNESCO World Heritage Programme (the management of these areas, however, was relatively poor);
- a large number of small NGOs, which, however, had not yet formed a powerful network and were working mainly locally;
- national environmental legislation, which is however difficult to be implemented, due to the lack of finances and administrative structures;
- the Protocol of Intentions from 1998, which was signed by scientists and NGOs from all countries concerned, except China.

The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, BMU, offered assistance to the process of setting up a biosphere territory, preconditioned that all national governments involved would agree. From the beginning, the German Federal Agency for Nature Conservation (BfN), had taken a key role in:

- facilitating the involvement of local initiatives, foundations and NGOs
- bringing international think tanks, such as Woodrow Wilson Centre in Washington on board and
- stimulating World Bank/GEF, to provide potential financing of projects.

You may ask what the special interests of the German engagement in this region are. The German interest in this region is based on the responsibility of the international conventions, such as CBD, the CCD (to combat desertification), and the UNFCCC (framework convention on climate change), in order to give environmental policy more international significance.

Germany traditionally has good ties with China, Kazakhstan, Mongolia and the Russian Federation, e.g. by a bilateral German–Russian environmental agreement that includes joint work in the Altai region, as well as a bilateral German–Chinese environmental agreement. Moreover, Germany has gained a lot of practical experience in the field of biosphere reserves, for instance, model regions, transboundary policy of water and nature protection, as well as environmental technology and dealing, cooperating and disputing with NGOs. The results show that the concept of biosphere reserves may not only contribute to, but also support and promote sustainable development in remote areas.

In addition to this, there are already existing activities of the Regional Environmental Centre (REC) Central Asia in Almaty and the MAB-committee in this region, as well as the activities of international and German NGOs, so as WWF and NABU and foundations, such as Heinrich-Böll Foundation and Succow Foundation, as partners to establish local NGOs. Several Workshops in Bonn, Novosibirsk und Ulaanbaatar were initiated with constantly increasing participation, agreement and quality of results. As China's participation was open for a long time, due to the very difficult decision structures, we see today that the Chinese part has taken the coordination with very ambitious ideas in the field of ecology. A first step was to carry out a feasibility study, to figure out the mutual contingent of the diverse regional and national interest and goals and to analyse the suitability of real life. The aim is enforcement of the regional economic power without ecological devastation by:

- environmental friendly production
- enhanced marketing
- certification
- adapted infrastructure
- energy supply
- support of local and regional business.

First results of the feasibility study that started in 2002 were discussed during the above mentioned conference in Urumqi, in midyear 2004. The study was finalized in November 2004 with a positive vote and another Protocol of Intentions, signed by all heads of departments, for the establishment of a transboundary biosphere reserve. This protocol was sent to the national governments concerned.

Now the implementation is on the agenda: The selection, means of financing and realisation of projects, organisation and enforcement of local and regional structures in communication and action. During the coming German-Russian consultations, a declaration of all ministers of environment is going to be prepared for being signed in Berchtesgaden, Germany.

Successful regional approaches can help to enhance the acceptance on the highest political level. But the process has to be accompanied by a permanent evaluation and monitoring of results. Sustainable development has not to be persisted in the experimental stage, but has to be anchored in the region, including an adequate proportion of economical input and personal assignment. This means, it doesn't make sense to acquire huge amounts of money for investments, if you don't ensure that after the beginning phase the projects continue, e.g. by support of long-term consultants.

In the context of the global challenge, the Altai-project may be only a small step stone. But if the process is successful, it can grow - due to its complexity – to a perspective for other regions with similar potentials.

Transboundary Cooperation and Local Sustainable Development along the Balkan Green Belt

Gabriel Schwaderer, EURONATUR, Germany

Introduction

Transboundary cooperation is an essential tool to stabilize regions with a recent history of conflict and war, such as the Balkans. Within this context, nature conservation and local sustainable development are relevant issues.

Best practice examples of transboundary cooperation taking into account local sustainable development along the Balkan Green Belt, demonstrate that there is an option for coexistence of nature conservation and sound economic development in rural areas.

EURONATUR is an international operating foundation, based in Germany. Main objective of EURONATUR is to implement model projects in rural areas, based on the principles of the Convention on Biological Diversity. At the same time, the basic idea is that nature knows no boundaries; therefore transboundary cooperation in conservation is essential.

The paper will give two examples with a high profile, regarding transboundary cooperation and sustainable development on a local level. These examples are selected among projects being conducted along the Green Belt of Europe. The European Green Belt initiative, launched by IUCN and the German Federal Agency for Nature Conservation, is an excellent example how to improve transboundary cooperation. The objective of the initiative is to conserve the former iron curtain between eastern and western Europe as a green belt throughout Europe. EURONATUR has been mandated to coordinate activities of the south-eastern part of the European Green Belt. One of the reasons is that EURONATUR has been involved in conservation projects on the Balkans for more than 15 years.

A basic element of the philosophy of EURONATUR is to cooperate with local partners to implement concrete on-site conservation activities. EURONATUR has a strong understanding that nature conservation in cultural and inhabited landscapes is always connected with a sound socio-economic development.

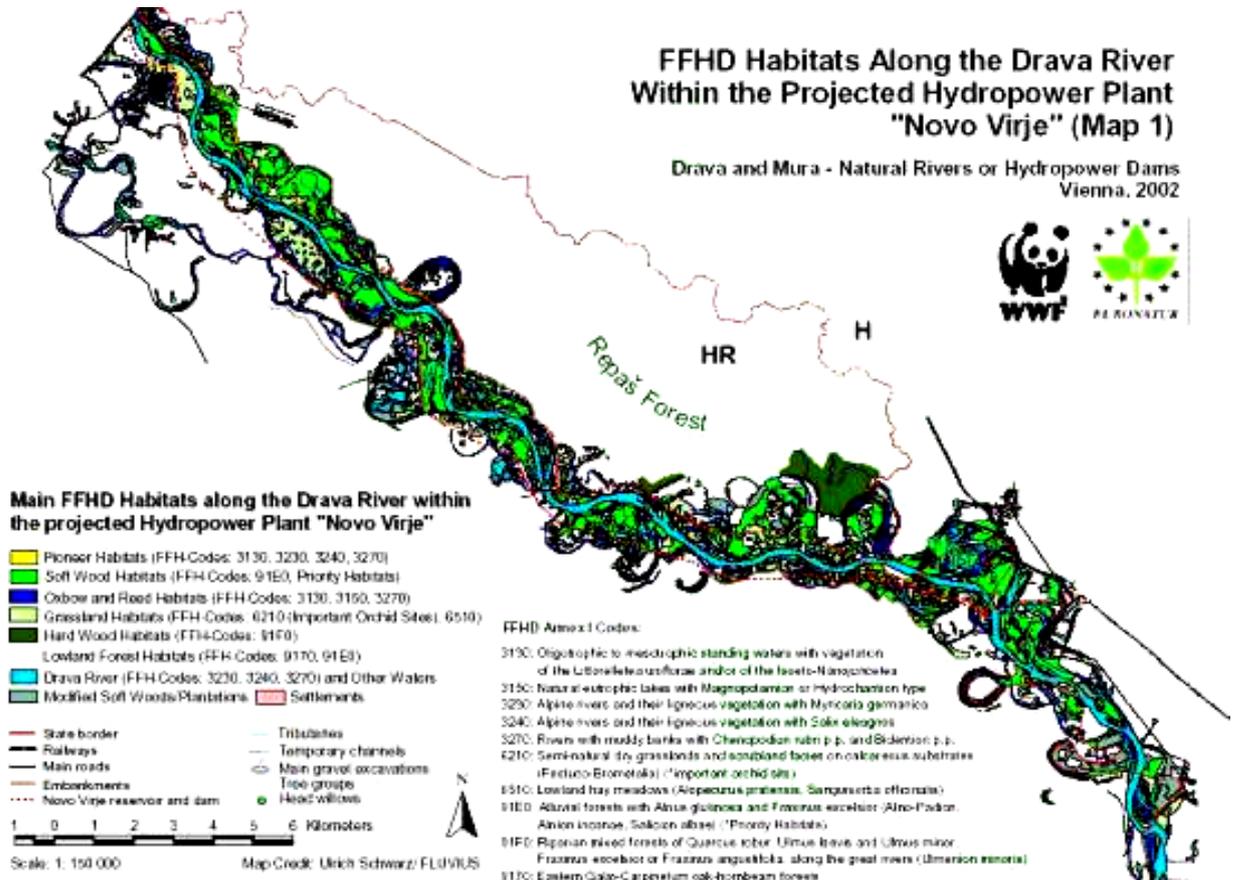
The Drava-Mura river system – A European Life Line

The river system of Drava and Mura is unique in central Europe. It still has a length of about 350 kilometres without any hydropower plants or other significant damages to the natural river dynamic. Five different countries are part of the river system: Austria, Croatia, Hungary, Serbia-Montenegro and Slovenia.

Nevertheless, there is a serious threat to this river system. The Croatian government still keeps the outdated plan, which was developed three decades ago to build old fashioned hydropower plants along the Drava. In Croatia, some of those hydropower plants were built during the Yugoslavian period still. EURONATUR, together with WWF and a number of local partner organisations, has analyzed the habitats relevant for the Flora-Fauna-Habitat-Directive in the area, threatened by the planned hydropower plant “Novo Virje”.

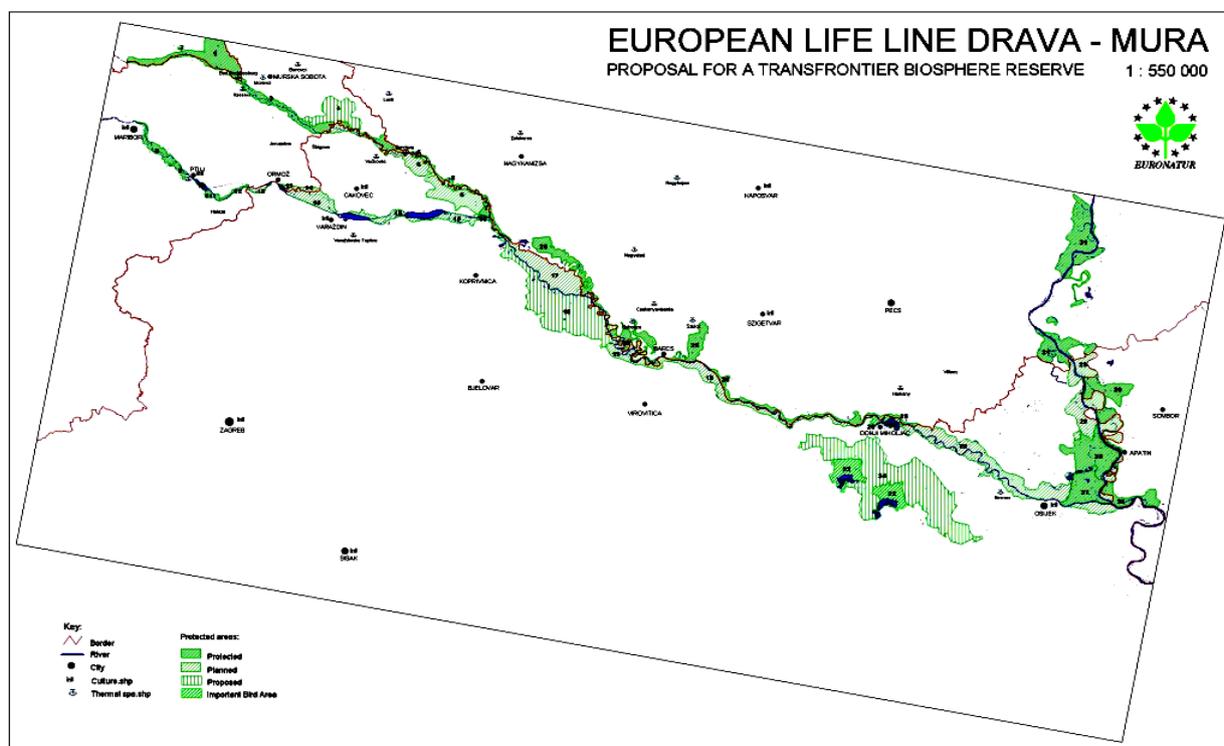


These two slides were made from the same spot nearby Heresznye in Hungary. The left picture shows the situation in 1990 and the right picture in 1996. The natural dynamic of the Drava is obvious. Photos: Martin Schneider-Jacoby, EURNOATUR



This study proves that there are strong ecological and scientific arguments to preserve this threatened part of the river system. But, at the same time, the needs as well as the socio-economic situation of the local population have to be considered. EURONATUR is convinced that it is not enough just not to build the hydropower plant, which would at least generate some income and labour, but new and intelligent concepts for the economic development of this rural area need to be developed. With the concept of a transboundary biosphere reserve, one essential tool for such a development was identified in cooperation with the mayors and local communities.

The question is how to implement the concept of such a transboundary biosphere reserve. One key approach is to detect solutions with regard to agro-biodiversity, to implement sustainable land use and to organise benefit sharing.



EURONATUR together with local partners prepared a proposal for a transboundary biosphere reserve.

Key factors for agro-biodiversity in an open flood plain, which dominate in most parts of the Drava-Mura system are the grazing schemes. In a centuries lasting process, breeds adapted to the specific conditions of the Drava-Mura flood plain were raised. Today, only Hungarian Grey cattle are still occurring in relevant numbers. But in our case study in the adjacent Sava low lands, we found the Posavina horse, the Podolac cattle and the Turopoljer pig. All these different breeds have a specific importance for the agro-biodiversity. E.g., with its hoof, the Posavina horse creates open patches in the soil, which enables the existence of a specific plant community. The breed was threatened by extinction about ten years ago. Together with local partners, EURONATUR identified as many individuals as possible and a small subsidy was paid to the farmers, if they guaranteed to keep the animals. The next step was to convince the government to integrate this traditional breed into the official subsidy system. Subsequently, we supported the farmers to market their animals and to increase their

income. This example can be considered as successful implementation of the Convention on Biological Diversity.

The Prespa and Ohrid Lake system

The Major and Minor Prespa Lakes, as well as the Ohrid Lake, form one of the oldest lake systems in the world. It is located in the transboundary area of Albania, Greece and Macedonia. The recent developments are a remarkable example for successful transboundary cooperation in a region, which has been affected by conflict and crisis for many years, both in history and in recent times. International cooperation in the area demonstrates that nature conservation can also serve as an important tool to prevent conflicts.

In February 2000 the three prime ministers of Albania, Greece and Macedonia signed the "Declaration on the Creation of the Prespa Park". In this context "joint actions" are agreed on in order to:

- 1) Maintain and protect the unique ecological values of the Prespa Park
- 2) Prevent and/or reserve the causes of its habitat degradation
- 3) Explore appropriate management methods for the sustainable use of the Prespa Lake water, and
- 4) To spare no effort so that the Prespa Park becomes and remains a model of its kind as well as an additional reference to the peaceful cooperation among our countries".

The transboundary cooperation process is driven mostly by the Prespa Park Coordination Committee that consists of representatives of the responsible ministries, the local authorities and local non-governmental organisations. A number of international observers are nominated, such as international donors and international non-governmental organisations. In March 2005, the Coordination Committee took the decision to designate the Prespa Park with its five large protected areas as a trilateral biosphere reserve. This will improve and intensify the transboundary cooperation between the three countries involved.



The map shows the trilateral Prespa Park with the violet border. The different protected areas are indicated in different colours.

The Prespa Lake catchment area is one of the hot spots for biodiversity in Europe. The region is characterized by a high number of endemic plant species and more than 60 endemic fauna species are known. Three globally threatened bird species are breeding in significant numbers around the Prespa Lake. The surroundings of Prespa and Ohrid are an important part of the very small range of the Balkan lynx. The Balkan lynx is supposed to be the most threatened autochthonous lynx population in Europe and considered to be a lynx subspecies. An approved genetic status as a good subspecies would lead to a listing as a critically endangered species in the IUCN Red List.

The successful implementation of nature conservation concepts in the Prespa Park is only possible when considering the needs of the local population. There are about 30.000 people living in the transboundary Prespa Park. In the Albanian Prespa National Park, which is a 270 square kilometres large national park forming an important part of the transboundary Prespa Park, about 5.000 people are living. In regard of the scientific aspects only, choosing the national park category might not be the best choice, because there are so many people living in the national park. They are using and in some parts even over-exploiting the natural resources. The following examples can demonstrate how local sustainable development in the Albanian Prespa National Park is improving the ecological value of the park and, at the same time, is improving the socio-economic situation of the people living in the park.

EURONATUR and many other organisations supported farmers in the field of agro- and ecotourism, in order to build up small guest houses and pensions. Currently, there are about

75 guest beds in place in the park. Renting rooms to domestic and international visitors and tourists helps the local people to generate alternative sources of income not related to direct use and over-exploitation of the natural resources of the park.

In the management and development zone of the national park it is permitted to collect mushrooms, to harvest medicinal plants and wild fruits. The support of marketing these products in more efficient and professional way is an important contribution to create added value of natural resources.

The additional sources of income led to a reduction of the number of livestock in the park. When the park was founded in 1998, more than 12.000 sheep and goats were counted. In the meantime, due to the mentioned factors, the number decreased to less than 3.000. Especially goats are preventing forest regeneration through their specific grazing and browsing behaviour in a radical way. With the significant drop down of goat and sheep numbers in the national park unexpected fast and comprehensive forest regeneration started. At the moment, in the Albanian national park about 3.500 hectares are declared as complete livestock free zones. For example, in the livestock free zone nearby Gorice e Vogel, with a size of 800 hectares, in only three years autochthonous trees (mainly oak) grew almost two meters high. The strongly degraded area has recovered in a very short period of time and the regenerated oak trees are preventing the slopes from erosion. Within the next five to ten years, concepts for sustainable use of the regenerated forests at least in some parts of the livestock free zones could be started. Subsequently, it should also be considered to reduce wood cutting in the so-called communal forests. At the moment, wood is the most important source for heating energy.

With many small steps the situation in the Albanian Prespa National Park improved significantly, regarding biodiversity conservation, sustainable use and the socio-economic situation of the rural population. Similar initiatives are going on in the Greek and Macedonian part of the Prespa Park. Therefore, this trilateral protected area could serve as a model for the entire Balkan region.

With the experiences from the projects briefly summarized above, EURONATUR is convinced that it is possible to develop similar processes in the Southern Caucasus in general and in Azerbaijan in particular.

Nature Conservation and Utilisation: Examples from Azerbaijan

Prospects of Development of National Park in Azerbaijan

Eldar Sariyev, Ministry of Ecology and Natural Resources, Azerbaijan

Especially protected natural territories and objects are of national wealth for Azerbaijan and have particular ecological, scientific, cultural and aesthetic values. Especially protected natural territories in the Republic are regulated, according to the Law “on especially protected natural territories and objects”, which was adopted by a Decree of our National Leader Mr. Heydar Aliyev on March 24, 2000. Especially protected natural territories can be of the following kinds: state natural reserves, including biosphere reserves; national parks; natural parks; ecological parks; state natural prohibited areas; natural monuments; zoological parks; botanical gardens and arboretums; health improvement places and resorts. According to the available legislation in the former Soviet Union, only three kinds of the said especially protected natural territories had functioned. These were state reserves, state prohibited areas and natural monuments. The state reserves, which had been under a strict protection regime, comprise 14 state reserves that were functioning in the Republic, with a total area of 191.200 hectares, which made up 2.2% of Republic territory. The territory of the state prohibited areas, which now require a level of protection and especially protected natural territories altogether occupy 5% of Republic territory.

The Republic of Azerbaijan is a country with the richest natural resources in the Caucasus region. The human activity connected with the natural environment and resources results in expansion of man made affected landscapes and causes, significant increase of violation of the initial conditions of natural complexes. Presently, it is not possible to find natural complexes that were not subjected to human influence. Namely, due to this reason, especially protected natural areas are of great importance for the protection of natural complexes and to study natural movements of natural processes. The development of especially protected natural territories and the preservation of ecosystems play a significant role in the protection of wild nature and its study. As the result of activities of especially protected natural territories, the opportunity was created for the protection of rare endangered species of flora and fauna.

The necessity to implement some active measures, in order to bring the system of especially protected natural territories of the Republic in conformity with modern requirements (protection of all necessary ecosystems and main species, creation of corridors and protection stripes) had arisen.

As the result of purposeful activities, implemented by the Ministry of Ecology and Natural Resources, in the direction of the development of the protection of especially protected natural territories, the creation of an ecological network, the coverage areas of these territories have increased from 5 to 8% and the concrete and practical works to bring this amount to 10% are conducted now. The process of the creation of national parks had been started in the Republic, at the first time within a short period six national parks were created.

The system of national parks is the best favourable area for the protection of etalon areas of nature, genetic varieties of flora and fauna, the development of tourism and the

implementation of other kinds of activities for the protection of nature. According to the current national legislation, national parks are territories where natural complexes having special ecological, historical, aesthetic values. Other important natural resources and territories have the status of natural protection and scientific-research organs, used for nature protection, enlightenment, scientific, cultural and other purposes. The main objectives of national parks are to protect natural complexes, rare and etalon natural areas, historical and cultural objects, creation of conditions for tourism and recreation, the preparation of scientific methods of nature protection and ecological enlightenment, ecological enlightenment of population, implementation of ecological monitoring and restoration of damaged natural and historical-cultural complexes.

In order to further develop this important kind of especially protected natural territories in the Republic, the Ministry of Ecology and Natural Resources continues its activity in direction of an increase of the number of national parks. Thus, presently the matter of creation of national parks around the beautiful Goy-Gol Lake, located in the Lesser Caucasus range, is under discussion. Appropriate works are carried out with relevant organizations in order to turn the Goy-Gol State Natural Reserve into a national park. The presence of very favourable conditions here for complex protection of nature and development of tourism is an undisputable fact.

It is planned to look into the matter of giving the status of a national park to the Eldar pine tree State Natural Reserve, which was created in the western part of the Republic. Works conducted in direction of the creation of infrastructure are recently set. National parks show that such kind of especially protected natural territories will be developed quickly and will set its relevant activity, according to its status.

Ordubad National Park named after the Academician Hasan Aliyev

It was created in the territory of the Ordubad administrative region of the Nakhichevan Autonomous Republic in 2003, on the base of a state natural prohibited area, with an area of 12.131 hectares. The main purpose of the creation of the national park is to protect separate components in the territory, specific climate, relief and other physical geographical features, conduction of ecological monitoring here, along with the protection of rare and endemic animals of different species, implementation of ecological monitoring, tourism, ecological enlightenment etc.

Shirvan National Park

It was created in June 2003, in the administrative areas of Salyan, Neftchala and Baku city Garadagh district with an area of 54.373,5 hectares. By comprising of complex territory Shirvan State Natural Reserve and Bandovan State natural Prohibited area altogether have a square of 65.580 hectares. The main purpose for an creation of the National Park is the protection and reproduction of main components of a semi desert landscape, including rare species of gazelles, included in the "Red book" of the Azerbaijan Republic, as well as other fauna species being specific to this area, implementation of ecological monitoring, tourism and recreation, enlightenment of population etc. The Gizilgaz (Chala) lake, with a main watered swamp area, has an importance as a place for wintering of migratory birds. The Caspian coasts comprise main area in a 30 km long border zone.

Ag-gol National Park

It was created in the administrative areas of the Agcabedi and the Beylagan regions on the base of the Ag-gol State Natural Reserve, with an area of 17.924 hectares. It was recognised as a RAMSAR site for its watered swamp places with international importance as wintering places mainly for water birds. Ag-gol is a typical well known plain-lake ecosystem. The National Park is a place of living of migrating and local birds and animals in plain regions of Azerbaijan. Thousands of birds are reproduced here; they rest during their migration and coming here from north. The first step in the protection of the lake was done in 1964, with creation of a prohibited area of 9.173 hectares. The status of strict protection was given to 4.400 hectares of the water area of the lake in 1978. The main purpose of the creation of a National Park is to protect landscapes, endangered species living in the lake and in the ecological complex, that they are accustomed and as well as monitoring of the environment and the development of education and ecotourism.

Previously the lake covered a part of the big plain in the Kura valley. Presently, after the building of the Mingechevir water reservoir, the created complex is part of an irrigation system. Ag-gol is a lake with a changing depth of 0.5-2.5 meters. The lake is surrounded by rushes. Being a typical plain lake its water level changes in hot seasons and reaches the lowest level by the end of summer. The area of the National Park consists not only in swamps, but has typical plain and semi desert landscapes.

Despite of not having a landscape trend, Ag-gol's protection has international importance, being the shelter for endangered birds of this lake, which are listed in the "Red Book". Among these birds are white goose, black stork, sultan hen, flamingos, pelican, little bustard, heron birds' varieties and varieties of ducks, geese and others. Till the early 1960, gazelles lived in surrounding areas of Ag-gol. The reintroduction of this species is expected in the near future.

Hirkan National Park

It was created in the administrative areas of the Lenkaran and Astara regions in February 2004, with an area of 21.345 hectares for the protection of rare endangered flora and fauna species and for the development of ecotourism. Hirkan is one of the richest regions in the Caucasus for its biodiversity. Great nature scholars like Radde, Satunin, Grossheim, Vereshagin, Prilipko, Spangenberg had given a special attention to the study of flora and fauna of this region. Once widely spread along the Kura–Araz rivers the turan tiger was under danger disappear in the Hirkan subtropic jungles. Other species met in this area are leopard, caracal, hyena etc. and they were included in the "Red Book" of Azerbaijan. The creation of the national park played an important role in protection of plant dendrofund of this region. The Hirkan forest is a natural monument, preserved from the Ice period, a place where hundreds of dendroflora types were preserved. It plays an important role in the protection of mainly iron tree, Lenkaran acacia, oak, eastern oak, eastern pistachio, fig and some other species.

Altiagaj National Park

It was created on the basis of the Altiagaj State Natural Reserve, for purposes of development of ecotourism and protection of the landscape of the Big Caucasus southern-eastern natural landscape in an area of 11.035 hectares, of the administrative territories of the Khizi and Siyazan regions, in August 2004. The rich biodiversity of this area will create conditions for recreation of both, local and foreign tourists in a mountainous environment. In

this area one can meet with coastal, littoral and psammophyte plant types in horizontal stripes, desert and semi-desert, some greyness in mountain hills, xerophyte type bushes and at last, mountainous mesophile meadows in the forest line.

Absheron National Park

It was created on 783 hectares of the Shahdili cape of the Absheron peninsula, in December 2004. This is an area where the only representative of Pinnipedia animals in Azerbaijan, like the Caspian seal comes out to coast. This is an important area for big amounts of wintering and resting of water swamp birds during their migration. The creation of this National Park is important, because of its location nearby the capital of Azerbaijan - Baku city and because it is favourable for the creation of conditions for tourism and recreation, methodological research on ecological enlightenment and nature protection, ecological enlightenment of the population, implementation of ecological monitoring, restoration of nature and historical-cultural complexes.

Fauna Protection in Azerbaijan and its Main Problems

M. A. Musayev, Sujaddin Guliyev, Zoology Institute, National Academy of Sciences, Azerbaijan

At June 5, 1972 - the Day of Global Environment Protection, the agenda was accepted by the UNO General Assembly, on problems related to environment protection for opening of the Stockholm Conference. In this connection, according to a resolution adopted by the UNO, June 5 was declared as Global Environment Protection Day. The protection of environment, including fauna in the Republic is one of the internationally significant issues.

Azerbaijan's fauna has rich biodiversity, due to its climatic varieties. Such a wide range of biodiversity is unique in the Caucasian ecoregion.

Modern biodiversity of Azerbaijan's fauna is very rich and comprises of more than 1.500 species of protozoa, over 1.200 species of animal parasite worms (helminths), over 300 species of phytohelminths, over 290 species of rotatoria, over 360 species of crustaceans, over 25.000 of parasites, over 1.100 species of arachnids, 311 species of snails, 101 species and sub-species of fishes, 10 species of amphibians, 52 species of reptiles, 364 species of birds, 107 species of mammals.

Protection of fauna is in the focus of state and public and relevant ecological units in Azerbaijan with its actuality. As it is known, the protection of fauna in common sense makes an integral composite part of environment protection.

The information will be given in this article is about the current ecological condition of separate groups of fauna living in Azerbaijan and problems related to their protection. The first of them is protozoa. Protozoa - formed as one organism, have living activity and are comprised of one cell. These animals unite all specific features belonging to cells and entire organism.

One of the groups of Azerbaijan fauna having rich biodiversity is multi-cellular invertebrates. This group is comprised of about 2.000 species united in ten types. The majority of them (90%) are arthropods. 90% of them are insects.

The second place in the Republic's fauna belongs to nemathelminthes (1084). The following types with many species are prevailing in Azerbaijan fauna: snails (311 species), flatworms (542 species), tape-worms (180 species) and thorny headed (46 species).

The vertebrates of the Azerbaijan fauna have 623 species. Round mouthed class represented with one species - Caspiomyzon Wagner Kessler. The number of this specie reduced sharply, it became a rare species and was included in the Red Book of Azerbaijan.

From osteichthyes 97 species, belonging to a total of 13 groups in the freshwater sources and ten groups in the Caspian region were registered. Ichthyofauna of Azerbaijan had 89 aboriginal and the rest was brought in from outside species. It is typical for the Caspian Sea to have many endemic fish species. More than 25 species of ichthyofauna are considered as endemic for Panto-Caspian complex. There are some ecologic dangers for fish fauna in

Azerbaijan and the main of them is absence of uniform conception, regulating effective use of Caspian bioresources. The most spread fish species in the Azerbaijan section of the Caspian Sea is weight type fishes. This species prevail others (28 species).

30 species of fishes are caught in the Caspian section of the Republic. Many of them are caught in the Kura River, in lakes around the Kura, in ponds, Shamkir and Mingechevir water reservoirs. The majority of these species are transitory and semi-transitory (they are grown in the sea and pass to rivers for reproduction). The most valuable species of transitory fishes are: goldfish, sturgeon, long-nosed fish etc. Snake fish, sazan also belong to this species. Semi-transitory fishes, which have industrial importance, are: bream, sazan, omul etc. There are many herrings and sprats in the Caspian Sea.

There are some natural and man made influences which cause a weakening and the reduction of ichthyofauna in Azerbaijan. The first of them is the construction of various waterworks on the Kura River after 1959; second the regulation of the Kura river flow, also the pollution of the Caspian Sea, poaching and fishing. Beside, not observing the scientific-methodical norms resulted in a decrease of industrially important fishes. It is to be noted that there are reasons like the liquidation of some fish breeding enterprises, in connection with the lowering of the Caspian Sea level and a lack of investment for the construction of new ones, financial constraints of those plants etc. All these lead to the weakening of the fishery industry and the reduction of ichthyofauna. Construction of Banka plant for artificial increase of sturgeon and other fishes, having industrial importance, shows the sign of revival in this field.

Ten species are included in Amphibia class of vertebrates of Azerbaijan. Among them are *Tritus vulgaris*, *Tritus cristatus*, *Peleobats suriacus*, *Peleobats cauasicus*. The most spread species of Amphibia are *Bufo viridis* and *Rana ridibundas*.

Problems of protection of Amphibians in the Republic were settled, partly due to enlargement of protected areas, but settlement of some problems in this field is still required:

1. Prevention of losing man made effects on habitat areas (reduction of water basins and its drying);
2. Minimizing of application of poisonous chemicals in economies;

One of the problems having importance in protection areas is the release of species with especially protected status to nature, after being artificially reproduced. It must be implemented certainly.

First specific representatives of vertebrate fauna living on land are reptiles with 52 species. Most species of reptiles live in deserts and semi deserts. Most frequently met of them are *Testudo graeca* (Mediterranean turtles), *Cyrtopodion caspius* (kekkon), *Trapelus ruderatus*, *Vipera ursine*, *Vipera xanthina*, *Vipera lebetina*, *Agkistodon halys* etc. 9 of 52 reptiles had been included in the Azerbaijan Red book: *Testudo graeca* (Mediterranean turtles), *Trapelus ruderatus*, round head lizard, black-head *Rinochoclpmus*, reddish mabouya, viper and Orsini's viper.

One of the problems in protection of valuable reptiles is to prevent turning of natural landscapes, resided by human beings to agrocenosis, as the result of man made activities,

not to allow turning their habitat areas in rocks to open pits, to prevent annihilation of some invertebrates that make the fodder of reptiles.

Catching of reptiles, as well as other endangered amphibians by amateur collectors, the matter of their sale in black market for getting some earnings, are considered as main problems in the protection of animals under today's conditions. Legal acts adopted in the sphere of protection, supported by law enforcement bodies and social-ecological structure is to be used to solve this problem. Avoiding annihilation of some species of reptiles after being caught by men may help to solve this problem.

Representatives of groups that have a large number of species compared to other groups, thus having rich biodiversity among land vertebrates of Azerbaijan and living in various ecological conditions are united in the Aves group (birds). 364 species of birds belonging to this class were registered in the Republic. All available birds' species were not studied in detail on taxonomic features. Birds inhabiting Azerbaijan are united in 17 groups and 60 subgroups, due to taxonomic features. 40% of birds belong to settled groups and are observed along the year, 27% of them are wintering birds and the rest are observed during migration.

45 species of birds have a various protection status in Azerbaijan. 36 species of them are included in the Red Book of the Republic and 23 were included in the IUCN Red List. It is to be noted that water-swamp birds like curly pelican, little cormorant, red chest goose, sandpiper, teal, from land birds - Caucasian tetra, eagle, white tailed sea eagle, little bustard, bustard and nice bustard (11 species) are also included in the Red List of International Nature Protection Union and Azerbaijan.

Presently, serious measures are taken for the protection of birds by the Ministry of Ecology and Natural Resources in the Azerbaijan territory in Gizilagaj reserve, Ag-gol National Park, Shamakhi hunting economy, Gil and Shahdili Prohibited Area. In these areas aboriginal as well as internationally important and rare and endangered birds are inhabited temporarily, one group of them nests and reproduces here and then flies away. There are many problems related to the protection of birds, which may cause various ecological dangers in the protection of avifauna. The major dangers are the limitations of inhabiting areas for birds, mass destruction of forests, drying of water areas, exceeding hunting of birds and their illegal hunting, expansion of cultivated area, collection of eggs of birds from their places of inhabitancy (either from islands or from nesting biotopes) and intensive turning of these places to cattle pastures. Besides pollution of inhabitancy area of birds in the sea, in connection with oil and gas extraction, leads to a sharp reduction of their natural habitats. All these problems are available in sphere of protection and their elimination and lessening of their influence by reducing are most actual problems.

One of the leading groups of land vertebrates are mammals. 4.675 species of mammals are known in the world. Among them 107 species and semi-species were registered in the Azerbaijan territory. Three species were brought to and acclimatized in Azerbaijan (island hare, swamp beaver and American raccoon). Thus, the mammals' fauna is divided in Azerbaijan into seven groups (insect-eaters, bats, hare-likes, rodents, predators, Artiodactyls), 25 subgroups and 57 categories.

16 species of mammals in Azerbaijan are considered as endemic for the Caucasus: *Talpa levantis*, *Sorex radde*, *Sorex caucasica*, *Sorex minutus*, *Neomus shelkovikovu*, *Duromus nitedula*, *rattus*, *Apodemus ponticus*, *Microtus majori*, *Microtus shelkovikovu*, *Microtus ighesus*, *Microtus roberti*, *Phoca caspica*, *Capra cylindricornis*, *Ovis orinetalis*.

95 species of Theriofauna are considered as largely spread in the entire Azerbaijan territory (seal, excluding three types of imported animals).

29 species of mammals fauna, which considered as its nucleus are numerous and ordinary species in Azerbaijan. Some are endangered and rare. Theriofauna species have a special protection status (Table 1).

Recently (during 1999-2004), interesting work has been conducted in the context of preservation, protection and sustainable development of natural resources of Azerbaijan, especially in relation to protected areas and biodiversity. An example is the clearing of Shirvan National Park from ships and the creation of Shirvan National Park on the basis of Shirvan State Natural Reserve. Besides, the creation of Ag-gol, Ordubad, Shahdag and Hirkan National Parks later may be considered as important work done in the field of protection of biodiversity and ecological safety.

Table 1 List of species belonging to Mammals having special protection status

	Scientific name	Name in Azerbaijani	Included in the Red Book of INPU	National status
1	2	3	4	5
1	<i>Rhilophus euryale blasius</i> , 1835	Cenub nalburnu (southern leaf-nosed)	+	Included in the Red Book of Azerbaijan
2	<i>Rh.mehelyu matshie</i> , 1901	Meheli nalburnu (leaf-nosed)	+	Included in the Red Book of Azerbaijan
3	<i>Barbastella Barbastellus Schreder</i> , 1826	Avropa enligulagi, (barbastelle)	+	Included in the Red Book of Azerbaijan
4	<i>Miniopterus schreibersii Kuhl</i> , 1819	Adi uzunganad yarasa	+	Included in the Red Book of Azerbaijan
5	<i>Tadarida teniotis rafinesque</i> , 1814	Boyukdodag enligulag	+	Included in the Red Book of Azerbaijan
6	<i>Myotis emarginatus Geoffrey</i> , 1806	Ucrang shappara	+	Included in the Red Book of Azerbaijan
7	<i>Nyctalus leisleri Kuhl</i> , 1817	Kicik axsham yarasasi (litle night bat)	+	Included in the Red Book of Azerbaijan
8	<i>Hystix leucura sykes</i> , 1972	Hindistan tirandazi (oxlu kirpi) (Indian echindna)	+	Included in the Red Book of Azerbaijan
9	<i>Lutra lutra L.</i> 1758	Chay samuru (river sable)	+	Included in the Red Book of Azerbaijan
10	FELIS (Otolcolbus)	Manul pishiyi (manul)	+	Included in the Red Book of Azerbaijan.

	Manul Pallas, 1778			
11	Lynx lynx L. 1758	Vashaq (lynx)	+	Included in the Red Book of Azerbaijan, in few numbers.
12	Panthera pardus L.1758	Babir (khalli palang) (striped tiger-leopard)	+	Included in the Red Book of Azerbaijan, very rare specie
13	Hyeana hyaena L. 1758	Zolagli kaftar (goreshan) (hyena)	+	Included in the Red Book of Azerbaijan
PINNIPEDIA - PINNIPED ANIMALS				
14	Phoca caspica Gmelin, 1758	Khazar suiti (Caspian seal)	+	Included in the Red Book of Azerbaijan
ARTIDAELYLA -CLOVEN-HOOFED ANIMAL				
15	Gazelle subgutturoza Guld,1780	Jeyran (gazelle)	+	Left in vary small part of protected areas. Included in the Red Book of Azerbaijan, very rare specie
16	Carpa cylindricornis Blyth, 1841	Dagestan turu (dag keli) (Dagestan moufflon)	+	Very numerous species. Endemic for the Caucasian region
17	C.aegagrus Erxleben,1777	Bezoar kechi (qaya kechisi), goat (rock)	+	Included in the Red Book of Azerbaijan. Endangered specie.
18	Ovis orinetalis Gmelin,1774	Kicik Asiya moufflon (vehshi goyun) Small Asia moufflon	+	Included in the Red Book of Azerbaijan. Very endangered specie.
19	Pupicapra rupicapra,1758	Kopgar (qara-pacha) (chamois)	+	Less numerous species. Included in the Red Book of Azerbaijan. Its number decreases.

Mammals are also affected by ecological threats. Mammals play a more important role in human life, thus they are more influenced by hunting, sales as meat and as living animals.

Finalizing our article we may say that one of the more important matters in the field of fauna protection is the need of animals for a territory, and the need to reserve these territories. six national parks (with a total area of 200.000 hectares, 15 state reserves (194.300 hectares), 20 state prohibited areas (with 330.400 hectares) are currently protected areas. They play an important role in the protection of fauna.

It is to be noted that territories of two state reserves (Basti chay and Garagol) and four state prohibited areas (Lachin, Gubadli, Dashalti and Arazboyu) (44.358 hectares) are located in occupied territories and their activity is fully suspended.

The second problem in the protection of fauna is the weak regime of conservation in protected territories. The deficiencies in this field are the weakness of a material-technical base in the protection work, very low salary of workers in this sphere, shortages in their

provision with optical equipment and arms. It is to be noted, that these deficiencies may be considered as technical shortages in fauna protection of Azerbaijan.

The third problem that is to be noted is ineffective use of scientific personnel in the field of biodiversity protection, building of implementation measures on non-scientific grounds, weakness of modern scientific analysis, lack of scientific monitoring, low record of fauna species, non use of aviation, which may be useful for getting operative and exact information. Solving these matters does not allow taking detailed information of natural animal resources and definition of its protection level.

One of the means in fauna protection of Azerbaijan is the quick implementation of the "Red Book -2" publication. For comparison it may be said that among the CIS countries the latest Red Book was published in 1997, in Belarus in 1981-93, in Kazakhstan 1st part - in 1978, 2nd part in 1996 and on flora in 1981 and 1991, in Uzbekistan in 1983, 1984, 1988, and 1998, in Georgia in 1981, in Armenia in 1987 and in 1990. Except Azerbaijan and Georgia many of them published this book for the 2nd and 3rd time or more.

One of the reasons causing problems in fauna protection is connected with the weak application of the legal base, i.e. laws and decisions for environmental protection and ecological stability. The solution of this problem is related to the enforcement of relevant laws in Azerbaijan; this could be a solution for many problems in fauna protection today.

References

- Musayev M. A. Rahmatulina I. K.: Fauna as integral part of natural resources of Azerbaijan and measures for its protection and preservation. Thesis of scientific practical conference dedicated to 80th anniversary of H .A. Aliyev- AR President. Baku-2003, pages 273-275.
- Musayev M. A., Guliyev S. M.: Actual Problems on ecological safety of fauna in Azerbaijan. Materials of scientific-practical conference on theme "Forest ecosystems of Azerbaijan". Baku 2004, pages 19-32.
- Fauna world of Azerbaijan. Part I, Baku, "ELM" 1995, page 276.
- Fauna world of Azerbaijan. Part III, Baku, "ELM" 2000, page 654

Organization and Conduction of Hunting in Economies of Hunters Society Union in the Azerbaijan Republic

Haji Ramazan Ismayilov, “Azerovchu” Hunting Union, Azerbaijan

I am very glad that the general director of Turkey’s National parks, named after great personality of the Turkish world, Mustafa Kamal, had given a floor to me. I want to start my presentation with the words of the esteemed academician, Budag Budagov. Indeed we all know the NATO as military bloc, but the conduction of today’s seminar with their initiative once again proved how much importance the NATO gives on the preservation of biodiversity and its effective use in Europe and all over the world, which is also reflected in support programs related to sustainable social-economic development.

Mr. Gossein Bagirov, Minister of Ecology and Natural Resources of the Republic, deserves also our gratitude for holding this seminar and for its high standard and context-wise organization. This seminar shows the importance for matters related to preservation of biodiversity in Azerbaijan and holding such seminars in future will be of great use for us. Let me to inform you briefly about the activities of the Hunters Society Union of the Republic of Azerbaijan.

The Hunters and amateur fishers Union of the Republic of Azerbaijan was established in 1960 at its 1st congress. “Azerovchu” (Azerhunter) began its activity as a commercially based organization and continues it nowadays. The main objective of the organization is to unite hunters of the Republic in one organization, to accept new members, to preserve fauna and flora of our native land, to develop it, to increase and to use these recourses effectively and according to law.

The head of this organization from 1960 to 1988 was a Hero of the Soviet Union, Aslan Farhad oglu Vazirov. During his management the organization developed, strengthened and was among the leaders in the former Soviet Union. After the demise of A. Vazirov, the following management of the organization brought it almost to bankruptcy, during the period till 2001. To stop this situation the 11th congress of the “Azerovchu” was called on June 22, 2001, where the management was changed.

The new management could correct the situation and withdrew the company from bankruptcy within a short time. The matter of protection of biological resources was put as a main issue along with other problems. “Azerovchu” had been given the following areas for use as hunting areas, according to contracts signed by the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan and its department on the regulation of use of environment and natural resources.

1. Sheki region - “Markhal” Hunting economy – area of 10.000 ha
2. Guba region - “Babadagh” Hunting economy – area of 61.000 ha
3. Devechi region - “Agzibir” Hunting economy – area of 21.000 ha
4. Khizi region - “Yashma” Hunting economy – area of 4.000 ha
5. Imishli region - “Sharbat-Gobu” Hunting economy – area of 20.000 ha
6. Jalilabad region - “Zavvar” Hunting economy – area of 20.000 ha

7. Bilasuvar region -“Mahmudchala” Hunting economy – area of 13.000 ha
8. Neftchala region – “Girmizikend” Hunting economy – area of 10.000 ha
9. Varvara water reservoir area “Varvara” Hunting economy – area of 7.760 ha
10. Absheron region “Pirallahi” Hunting economy – area of 10.000 ha

The last contract was signed on June 20, 2002 and the total area of these hunting economies is 176.760 hectares.

In the named hunting economies the following species are found:

In Varvara, Agzibir, Yashma, Sarbatgobu, Zavvar, Mahmudchala and Pirallahi – mainly migrating birds, ducks, geese and in Mahmudchala hunting economy – migrating birds, ducks, geese, coot and other birds are hunted.

In the hunting economies Mahal, Babadagh, Girmizikend wild boar, bear, hare, mountain goats and etc. are hunted. Different measures are conducted by our side for the protection of natural resources in all hunting economies. To keep the water level in a normal condition, water is poured from various sources – Mountain Rivers, channels to ports in the summer season in the Agzibir hunting economy. As a result, lake fishes in ports developed and weak and ill migratory birds remain in these areas and reproduce.

In the hunting economies of Zavvar, Mahmudchala, Sharbatgobu to keep the water level at the required level various sluices, channels are built and water is poured there from different sources. Various bushes, rooted plants, cereals are procured and stored in the winter period at severe climate to feed the birds and animals. Besides, various nests, holes, shelters and saline lands are built, fodder boxes are installed and fodder plants are grown. All these actions are done by active hunters and workers.

Presently, 37 hunting workers work in hunting economies. Besides, about 50 additional hunting workers control the protection of bio-resources. They register those hunters coming for hunting during the season, collect licenses from them, control the protection of hunting areas and observation of hunting rules, make approximate counting of migratory birds, combat poachers, have talks with the local population on the protection of natural resources. As a result of conducted works, the number of migrating birds had increased significantly. Comparing 2001 and 2004, one can see the difference in the number of animals in hunting economies of “Azerovchu”.

	2001	2004	Difference
Ungulates	11.193 heads	15.242 heads	+4090
Fur-leather	54.052 pcs.	68.010 pcs.	+13.958
Birds	4.028.493	497.970	

Presently there are 23 hunting houses, 245 hunter boats, 170 beds, sleeping sets in use of the hunting economies. We are now preparing seriously for the forthcoming hunting season. The roads leading to hunter houses, boats, economies are repaired. Sweet fodder is procured and stored for winter, when severe, icy climate presents. “Azerovchu” observes all conditions of contracts, signed with the Ministry of Ecology and Natural Resources on

hunting economies and we will exert all efforts for the protection of natural resources, its increase and effective use.

2004 will be fixed in our memory as one of the memorable years. Because in that year the Parliament of the Republic of Azerbaijan had adopted the Law on "Hunting" and the President had approved that law by Decree, dated on August 29, 2004. This law put in front of us matters like the protection of fauna, an increasing number of rare animals, strengthening control over hunting, feeding animals, saving them and increasing and organizing its hunting by economies as main tasks.

Today, I express my gratitude to the Ministry of Ecology and Natural Resources, personally to Minister Mr. Gossein Bagirov, on behalf of numerous hunters. The management of the Ministry, its collective, do a lot for the enlightenment of the population, for the protection and the preservation of nature, increases the fight against poaching, neutralization of poachers. We are proud of the activities. We always work in close contact with the Ministry in this field. Let me assure you, that today's seminars will have great importance for nature protection.

Aspects of Legislation of the Republic of Azerbaijan on Development of Hunting Economies

Hikmet Alizade, Ministry of Ecology and Natural Resources, Azerbaijan

Large scale legal reforms had been implemented and basic works were done on, strengthening the normative legal base in the country, by adopting the Constitution Act, dated October 18, 1991 on the Independence Day of the Republic of Azerbaijan.

The protection of environment, the complete renewal of legislation in the field of restoration of ecosystem used since a long time, including the protection and preservation of biodiversity and the rational use of natural resources are the main problems. After establishment of the Ministry of Ecology and Natural Resources, by Decree of the President of the Republic of Azerbaijan № 485, dated on May 23, 2001, fundamental work was done in this field, many normative acts' drafts, which reflect complete reforms in itself, were worked out and submitted to relevant organs for approval. The main purpose of these reforms is the creation of an effective control system in the field of environmental protection, the organization of the use and regulation of natural resources, the recovery of land, and the creation of an ecological balance.

The organization of hunting and the hunting economies in the Azerbaijan territory besides other fields did visible work regarding legally regulating their activities. The legal base that serves for reorganization and effective activities was created.

The adoption of the Law "On hunting" of the Republic of Azerbaijan, dated on April 20, 2004 among other normative acts, which was adopted during the last years in the field of regulation of activity of hunting economies in the territory of the Republic of Azerbaijan, is a worthy one. This Law that comprises six chapters, 31 articles besides explanation of meaning and purpose of hunting and hunting economies, also reflect normative information on organization and management in this field, control of protection regime and use, conduction of state hunting cadastre and monitoring, development of hunting economies and its placement.

It is noteworthy that previous legislative acts, especially the Regulations "On hunting and hunting economies in the territory of the Azerbaijan SSR", approved by the Azerbaijan SSR Council of Ministries Decision № 64, dated on February 8, 1983 to certain degree, had been regulating this area.

The main purpose in the adoption of new legislations is to build hunting economies' activity, according to modern requirements, to organize its work and increase its effectiveness and this Law completely meets these requirements.

Let's try to explain the meaning of hunting economies.

According to the old legislation, the hunting economy is a kind of economy that the main task of this sphere is to protect, restore state hunting fund, and effective use of them on scientifically grounded form.

According to the new legislation, the hunting economy involves: the protection and increase of wild animals', as well as breeding of wild species and releasing them in hunting areas and economic development through protection regimes that arranged for hunting purposes.

Just comparative analysis of these meanings allows us to note particularly the point of protection of hunting objects, i.e., wild animals, their increase and release in hunting places after breeding them.

One of the progressive points of the new legislation is maintaining the hunting economies. If in the old legislation this kind of activity was allowed to be enjoyed by juridical persons, in the new legislation the rights on use these economies were given to natural persons as well.

One of the important points is the control and management of hunting economies.

Thus, according to the old legislation, the control and management on conduction of hunting activities was implemented by the State Nature Protection Committee of Azerbaijan SSR, in new legislation right on state control on the management, protection and use of hunting economies was given to the Ministry of Ecology and Natural Resources. Thus Ministry has got exclusive rights like on definition of the Republic or the local hunting economies, adoption of decisions on its organization and liquidation, to approve schemes of development and placement of economies to organize its restoration, definition of use limits of wild animals in hunting economies, definition of payment types and categories.

One of the progressive points of the new legislation is a concrete definition of tasks of the hunting economies, which in its turn serves the building of activities of hunting economies in conformity with current legal rules, to effective and rentable organization of activity of economy.

Thus, according to legislation, the hunting economy has to obey the norms, standards and rules defined on protection and use hunting economies, to create conditions for tourism and recreation, to have primary stock taking of wild animals and use, to study their condition and living areas, to create checkpoints in economies, to register the hunters and to have stocktaking of hunted wild animals, to arrange placement of wild animals and new species that related to hunting objects and to release them to nature, to arrange artificial reproduction of animals and to implement measures, mentioned in the legislation of the Republic of Azerbaijan.

One of the interesting points in the new legislation is the definition of different types of use of hunting economies. Thus, by using the requirements of the Azerbaijan Republic law, the hunting economies may be used for the following aims:

- nature protection
- hunting
- scientific-research
- catching of wild animals for purposes of keeping them semi-independently and non-independently, for breeding and increase
- recovery
- education-behaviour
- ecological enlightenment
- tourism and recreation.

As it was stated above, the Decree No. 69, dated on May 26, 2004 of the Azerbaijan Republic, forms the basis for the organization and the activity of the hunting economies and has some progressive points. The preparation of relevant rules on some important indicators, which are mentioned in the Law "On Hunting" in this decree, is set as a task.

It is to be noted, that nine rules and one regulation had been worked out under guidance of the working group of the Ministry of Ecology and Natural Resources, related to the application of the Law "On Hunting" and were approved by decisions No. 147, dated on September 30, 2004 and No. 10, dated on January 27, 2005 of the Council of Ministries of the Azerbaijan Republic.

Especially, we'd like to briefly inform about the regulation "On Hunting economies", approved by Decision No.10.

In the Regulations, comprising of four chapters, tasks and functions of the hunting economies, its development and placement schemes, provisions on protection and use of hunting economies are reflected.

The above mentioned Regulations may be positively estimated. In this Law "On Hunting", provisions related to the activity of the hunting economies are clearly explained and its application rules and forms are given in detail. At the same time, the Regulations clarify some issues, which may arise in the context with local hunting activities.

In conclusion it may be said that the Azerbaijan Republic's Law "On Hunting" and the rules adopted in connection with its application play an important role in the organization of hunting and hunting economies in the territory of the Azerbaijan Republic, in implementation and management of its activity. Furthermore it leads to the creation of the unity of nature and society and their mutual relations, creation of an ecological balance, implementation of the use from animals' world, according to biological ethics.

Protection, Maintenance and Reproduction of Animals in the Baku Zoo

Azer Huseynov, Director of Baku Zoo, Azerbaijan

Recent developments and reforms affecting our economy and culture had been reflected in the life of Baku Zoo. Today I will draw your attention to matters of protection, maintenance and reproduction of animals in the Baku Zoo. I also want to inform you about current and forthcoming problems of the Zoo and its solutions. As you know, the activity of state bodies and NGOs is directed towards a solution of emerging problems and the protection of fauna. From this point of view, the Baku Zoo also acts in this line.

The Republic of Azerbaijan joined many International Conventions, as e.g. the Convention on regulation of international trade of endangered wild fauna species (CITES) and the Convention of protection and preservation of biodiversity (CBD). Furthermore some decisions were adopted recently for the protection of fauna (e.g. on especially protected natural territories, etc.).

The Baku City Zoo was established on January 2, 1942. But according to documents available by now, it may be said that in Baku city some efforts were made for the creation of a Zoo already in early last century. At that time some amateurs had their own private collections too.

I want to note that the history of the Zoo is an unopened page. There is a need for having historical researches and studies.

With the beginning of the XX century people developed parks not only in order to demonstrate animals. Now they also have to create a living gene pool of rare and endangered animal species, to be able to maintain them and ensure their reproduction. This is of particular interest in case of the need to release threatened species back to nature. As you know a Zoo is a site of culture and nature as well. It plays a great role in forming the attitude of human beings towards nature and environment and in order to increase zoological and ecological knowledge. Besides the living gene fund of various rare and endangered animals is maintained and increased here.

Four sections operate in Baku Zoo: the veterinary section, theriology (mammals), ornithology (birds), ichthyology and herpetology sections. Recently the new "science and information" section was established.

Specialists of the Zoo participate in conferences and in the development of measures for the protection of fauna objects. The National Academy of Sciences cooperates with the Zoology Institute. Recently scientific contacts were established with leading Russian scientific organizations in the Zoological field – the Zoological Institute of the Russian Academy of Sciences (St. Petersburg). Moreover the Zoo builds up contacts with foreign Zoos to cooperate with them.

Recently some positive changes occurred in the Baku Zoo. The conditions for maintaining animals were improved and besides the collection of the Zoo had been doubled and

enriched. From 1995-1996 were 200 heads of 70 species part of the zoological collection; presently there are more than 1.000 heads of animals, birds, fishes and reptiles of more than 140 species. Due to the exchange of animals with other Zoological parks, the number of species increased.

Various animals had already offspring in the Zoo: gazelles, big zebus, ponies, lions, sultan hens, wolves, peacocks, Chinese silk hens, kangaroos, various pheasants, fishes, turtles, white head griffon etc.

At the end of 2003, a new exposition was prepared, consisting of aquarium fishes and plants, the opening of the aquarium took place already. There one can see various fishes and plants from tropic countries, demonstrated in 30 pieces of big size aquariums. In 2004 a new exposition of pheasants was created.

Unfortunately it has to be noted that during the whole history of Baku Zoo only one company in one case provided aid to the Baku Zoo.

In 1980 the Baku Zoo was relocated from Bailov settlement to its present place, due to landslide danger in that area. Initially its area was planned to be 45 hectares. But later its territory was reduced from 20 hectares to 7 hectares and at last to only 2 hectares since 1985. In November 2001, according to the resolution of the Head of Baku city Executive Power, the area of the Zoo had increased about 2 hectares more and now counts 4,25 hectares.

It has to be mentioned that the areas of operating Zoos in the CIS countries normally have large areas: Thus the Rostov Zoo has 56 hectares, the Almaty Zoo has 54 hectares, the Kiev Zoo has 40 and the Dashkand Zoo has 23 hectares. The Moscow Zoo has 21 hectares in the city centre and 100 hectares in the Moscow region, which is used as a place for reproduction of animals in order to increase the numbers of rare species. The areas of other Zoos of the Caucasian states are also larger than our Zoo - the Yerevan Zoo comprises 12 hectares, the Tbilisi Zoo 8 hectares.

Due to the increase of the area of Baku Zoo in 2001, this year the financing of its new constructions is initiated. Next to the expansion of the area, we have to settle some other problems like: projecting of new areas; reconstruction works in the part of changed boundaries; fencing around the area; creation of new expositions; construction of open-air and closed cages; conduction of special constructions and installation works, laying of communication lines, installation of a heating system for animals and birds not withstanding cold; accomplishment of the Zoo area etc.

Besides we have to solve problems like the import of animals, which will be part of new expositions, their keeping and solution of feeding problems, training and instruction of workers caring for them and the training of young specialists as well.

It has to be noted that such animals which are considered as adornment of all Zoos and being loved by everybody, especially by children (e.g. African antelopes, giraffes, rhinos, hippopotamus, elephants, monkeys like chimpanzee, gorilla, gibbon, orang-utan, etc.) are

absent in Baku Zoo. This is mainly due to the unfortunate fact of lacking conditions for the maintenance of those species.

Throughout the whole year various wounded, left without care, ill and healthy animals are handed over to the Zoo. To accommodate these animals, to create the necessary conditions for them, to provide them with fodder, to arrange the required service by our personnel, we require additional resources.

Daily we receive many complaints about the keeping of wild animals from the population. We only may recommend to rather keeping at home popular animals, which are adapted to that condition.

About 30 Mediterranean turtles (Azerbaijan Republic Red Book), which were handed over to the Zoo in early 2004 were later released to nature after coordination with the Ministry of Ecology and Natural Resources (MENR).

Recently a variety of wild animals is kept in gardens, houses, restaurants and amusement centres. The problem is that the conditions of their keeping are very bad and unsanitary. These people who have no knowledge about their feeding and demands deprive those animals of free life and force them to die within a short time.

The Baku Zoo cooperates closely with MENR. For example, recently two weakened, thin and ill grey bears were confiscated from the Gusar region by employees of this region and brought to the Altiagach-North Zoo, together with employees of the Baku Zoo.

One employee of the Baku Zoo, the chief of the science and information section, T. Aydinov, is a member of the scientific-coordination council of the Ministry of Ecology and Natural Resources (MENR).

The Baku Zoo also closely cooperates with the mass media. Regularly staff of different TV-stations visits the zoo in order to get interviews.

The Baku Zoo is a member of the Association of Europe-Asian Zoos and aquariums (EARAZA) and annually participates in its actions. This association is a public organization that unites Zoos of the former USSR and some European states. In early May of this year I participated in the annual conference of EARAZA in the Czech Republic.

We would like to have conditions not only for the exposition of all rare and endangered species of Azerbaijan's fauna, but also for their artificial reproduction. Presently are not many species of the fauna represented in our Zoo. Concerning predatory animals are e.g. lynx, hyena, leopard, mau (Pallas cat), field cat, some birds, reptiles etc. missing. Closing my speech I would like to wish for everybody to adopt a sensible and patient attitude towards animals. We have to understand that all animals are an integrated part of nature. By loving and maintaining them, we express our attitude to the environment.

Programme

Seminar on Protection and Utilisation of Biological Resources for a Sustainable Development- with Special Reference to Azerbaijan – Baku, 6th of June 2005

Time			Chairperson
9:00 - 9:30	Registration		
9:30 – 10:15		Seminar Opening by <ul style="list-style-type: none"> • Gossein Bagirov: Minister of Ecology and Natural Resources, Republic of Azerbaijan • Hartmut Vogtmann: German Federal Agency for Nature Conservation • Thomas Strassburger: NATO-CCMS, Belgium, <i>Welcome by NATO Representative and Introduction to NATO Scientific Programmes</i> 	Gossein Bagirov (Minister of Ecology and Natural Resources, Azerbaijan)
10:15 – 10:30	Coffee break		
10:30 – 11:45	Keynotes Addresses	Conservation Areas and Landscape Biodiversity of Azerbaijan <ul style="list-style-type: none"> • Budag Budagov (Director of Geography Institute, Azerbaijan) <i>Azerbaijan landscape and biodiversity</i> • Vahid Hajiyev (Director Botany Institute, Azerbaijan) <i>The Role of Special Conservation Areas in Protection of Azerbaijan Biodiversity</i> 	Bettina Hedden-Dunkhorst (German Federal Agency for Nature Conservation)
	Keynotes Addresses	The Convention of Biological Diversity (CBD): <ul style="list-style-type: none"> • Sadagat Mammadova (Ministry of Ecology and Natural Resources, Department for Biodiversity Conservation and Specially Protected Areas, National Focal Point of the CBD, Azerbaijan): <i>Obligations and Implemented Activities under the Biodiversity Convention</i> • Nugzar Zazanashvili (WWF Caucasus Conservation Directorate, Georgia): <i>The Convention of Biological Diversity at a Regional Level: Issues of Negotiation and Implementation</i> 	

11:45 13:00	Perspectives of Biodiversity	<ul style="list-style-type: none"> • Azer Garayev (Head of Society for Protection of Domestic Animals, Azerbaijan.): <i>Environmental Ethics and Conservation of Bioresources</i> • Umayra Taghiyeva (Head of Hydrometeorological Forecasts Bureau, Azerbaijan.): <i>Negative Impact of Climate Change on Biodiversity</i> • Urmas Tartes (Estonian Agricultural University, Institute of Agricultural and Environmental Sciences, Estonia): <i>From Nature to Agrobiodiversity</i> 	
13:00 – 14:00	Lunch		
14:00 – 15:15	International Experience of Biodiversity Protection and Use	<ul style="list-style-type: none"> • Mustafa Kemal Yalinkilic (Nature Protection and National Parks, Focal Point on Biodiversity, Turkey): <i>Nature Conservation and Biodiversity of Turkey</i> • Gila Altmann (Former State Secretary Ministry of Environment, Nature Conservation and Nuclear Safety, Germany): <i>Trilateral Transboundary Management of Natural Resources as a Perspective for Sustainable Development in the Altai Region</i> • Gabriel Schwaderer (Euronatur, Germany): <i>Best Practices of Transboundary Cooperation and Sustainable Development along the Balkan Green Belt</i> 	Issa Aliyev (Ministry of Ecology and Natural Resources)
15:15 – 16:15	Nature Conservation and Utilisation: Examples from Azerbaijan (Session 1)	<ul style="list-style-type: none"> • Halil Ramazanov (Ministry of Ecology and Natural Resources, Azerbaijan.): <i>Conservation and Development Perspectives of Forests in Azerbaijan</i> • Eldar Sariyev (Ministry of Ecology and Natural Resources, Azerbaijan.): <i>Development of National Parks in Azerbaijan</i> • Sujaddin Guliyev (Zoological Institute, National Academy of Science, Azerbaijan.): <i>Issues of Current Importance in the Field of Fauna Protection in Azerbaijan</i> 	Arzu Olgun (Marmara Research Center, Chemistry and Environment Institute, Turkey)
16:15 – 16:30	Coffee break		

16:30 – 17:15	Nature Conservation and Utilisation: Examples from Azerbaijan (Session 2)	<ul style="list-style-type: none"> • Ramazan Ismayilov (“Azerovchu” Hunting Union, Azerbaijan) <i>Organization of Hunting Activities in the Hunting Management System of Azerbaijan</i> • Hikmet Alizade (Ministry of Ecology and Natural Resources, Azerbaijan.): <i>The Main Points of Hunting Management and its Aspects in Azerbaijan Legislation</i> • Azer Husseinov (Director of Baku Zoo, Azerbaijan.): <i>Conservation and Reproduction of Fauna in Baku Zoo</i> • Zulfugar Mammadov (Ministry of Agriculture) <i>Genetic Resources of Cultivated Plants in Azerbaijan and Their Use for Sustainable Development in Foodstuffs and Agriculture</i> 	Mustafa Kemal Yalinkilic (Nature Protection and National Parks, Focal Point on Biodiversity, Turkey)
17:15 – 17:45	Panel Discussion: Lessons Learned and Way Forward	Sustainable Development through Biodiversity Conservation and Utilization: Opportunities and Challenges <ul style="list-style-type: none"> • Hartmut Vogtmann • Urmas Tartes • Sadagat Mammadova • Eldar Sariyev 	Hikmat Alizadeh (Ministry of Ecology and Natural Resources)
17:45 – 18:00	Closure of the Seminar	<ul style="list-style-type: none"> • Gossein Bagirov: Minister of Ecology and Natural Resources, Republic of Azerbaijan 	

List of Participants

Workshop Opening

Gossein Bagirov	Minister of Ecology and Natural Resources (MENR), Azerbaijan
Hartmut Vogtmann	President of the Federal Agency for Nature Conservation, Germany
Thomas Strassburger	NATO CCMS Assistant Programme Director, Belgium

International Participants

Gila Altmann	Former State Secretary of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
Karin Bohnsack	EURONATUR, Germany
Thorsten Harder	Birdlife, Kyrgyzstan
Bettina Hedden-Dunkhorst	Federal Agency for Nature Conservation, Germany
Anatoly Kovshar	Ornithological Society, Member of the Academy of Science, Kazakhstan
Vitaliy Kovalyov	NABU, Germany
Victor Kulagin	NABU Rehabilitation Center Ananevo, Russia
Leif Dirk Miller	NABU, General Manager
Arzu Olgun	Senior Researcher, Scientific and Technical Research Council of Turkey, Chemistry and Environment Institute, Turkey
Heinrich Schmauder	Federal Agency for Nature Conservation, Germany
Gabriel Schwaderer	EURONATUR, Germany
Urmas Tartes	Estonian Agricultural University, Institute of Agricultural and Environmental Sciences
Valentina Toropova	Birdlife, Academy of Sciences, Kyrgyzstan
Mustafa Yalinkilic	General Director for Nature Protection and National Parks Focal Point on Biodiversity Convention, Turkey

	National Academy of Sciences
Ali Hasanov	Head of Mass Media Section (MENR)
Rahim Hasanov	Director of Turianchay Nature Reserve
Tagi Hasanov	Director of Pirgulu Nature Reserve
Nariman Hasanov	Director Garayazi Nature Reserve
Azer Huseynov	Baku Zoo, Director
Namig Ibrahimov	Director of Ismayilli Nature Reserve
Hudush Iskandarov	Director of Basitchay Nature Reserve
Ramazan Ismayilov	“Azerovchu” Hunters Union
Esmira Jafarova	Ministry of Foreign Affairs
Sevinj Karimova	Senior Consultant, Department of International Cooperation (MENR)
Mirmahammad Kazimov	Senior Consultant, Department of International Cooperation (MENR)
Elshan Majidov	Lead Consultant, Department of Bio-resources and Specially Protected Areas (MENR)
Sadagat Mammadova	Head of Department for Bio-resources and Specially Protected Areas (MENR)
Solmaz Mammadova	MENR
Zulfugar Mammadov	Ministry of Agriculture
Musa Musayev	Director of Zoology Institute, National Academy of Sciences
Arzu Mustafayev	Senior Specialist, Department of Bio-resources and Specially Protected Areas (MENR)
Emin Mustafayev	Consultant, Department of International Cooperation (MENR)
Jalal Naghiyev	Director of Garagol Nature Reserve
Javanshir Pashazadeh	Director of Gizilaghach Nature Reserve
Halil Ramazanov	MENR
Faig Sadikhov	Senior Specialist, Department of Bio-resources and Specially Protected Areas (MENR)

LIST OF PARTICIPANTS

Eldar Sariyev	Head of Division, Department for Bio-resources and Specially Protected Areas (MENR)
Elchin Sultanov	Azerbaijan Ornithological Society
Umayra Taghiyeva	Head of Hydrometeorological Forecasts Bureau, MENR
Ramiz Talibov	Director of Alty Aghach National Park
Bilal Verdiyev	Director of Goy-Go Nature Reserve
Yagub Yagubov	Director of Ag-Gol National Park