

DRAFT

**THE REPUBLIC OF UZBEKISTAN**

# **BIODIVERSITY CONSERVATION**

**NATIONAL STRATEGY AND ACTION PLAN**

**Tashkent**



# Approved by the Government of Uzbekistan

Prepared by the Project Steering Committee  
with the Financial Assistance of The Global Environmental Facility (GEF)  
and Technical Assistance of United Nations Development Programme (UNDP)

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# SUMMARY

In 1995, in recognition of the importance of biodiversity resources conservation to its sustainable development, Uzbekistan became a party to the International Convention on Biodiversity. This document is the first and indispensable step in taking the actions necessary to fulfil the country's obligations under the Convention.

Uzbekistan is primarily an agricultural nation and is therefore highly dependent on the quality of its natural resources. In the past Uzbekistan's development was unbalanced, with too much emphasis put on production, particularly agriculture, and not enough attention paid to control and protection of the environment. This approach, combined with highly centralised management, resulted in the undermining of natural resources rather than renewable use.

As a result of past policies; particularly the inappropriate and environmentally damaging development of the agricultural sector, Uzbekistan's biological resources have, in common with other Central Asian states, undergone a drastic reduction in the past 30 to 40 years. This has resulted in the total destruction of some ecosystems, the serious endangering of others and a threat to the overall ecological stability of the Republic.

A roll-call of the damage inflicted includes the destruction of the Aral Sea and its surrounding areas; an almost total loss of unique riverine areas (tugai); the degradation of desert and steppe which has in turn led to an acceleration in desertification; and a decline in critical water catchment areas in the mountains.

The environmental catastrophe of the Aral Sea serves as a reminder of the economic, social and political costs of allowing such damage to continue unchecked. Awareness and understanding need to be fostered concerning the importance of biological resources in maintaining basic ecological stability and life support systems. And for the country to achieve future sustainable development, proper consideration must be given to biodiversity conservation and its sustainable use in national development planning.

## **National Biodiversity Conservation Strategy**

Contents: The biodiversity convention emphasises three basic objectives - the conservation of biodiversity - the sustainable use of its components - and the fair and equitable sharing of benefits. The national strategy issues from this context and is based on an assessment of the particular status and management of biodiversity resources in Uzbekistan. It has been agreed that, in order of priority, the key issues to be addressed in Uzbekistan are.

The reorganisation and expansion of the protected areas system: this includes rationalisation of legal and institutional aspects; reorganisation of management approaches for protected areas to incorporate an integrated approach which combines conservation and sustainable use objectives; establishing of new protected areas and expansion of some existing ones to ensure maximum representation and a viable sample of ecosystems and habitats; and an increased level of local government / community participation and support

Public awareness, education and participation in biodiversity conservation and sustainable use, including: development of public awareness programme aimed at all levels of society but with particular emphasis on decision makers, local governments, communities in priority areas and youth; development of education plan within schools and universities; encouraging the participation and support of local communities and general public for protected areas.

Development of sustainable use mechanisms, including: creation of sustainable use models

within the context of protected areas which can be duplicated elsewhere; assessment of current and potential sustainable use in Uzbekistan and mechanisms for its development and regulation; assessment and planning concerning biotechnology, bio-pharmaceutical and agro-biodiversity development in Uzbekistan.

### **The Biodiversity Action Plan**

The action plan, elaborates as far as is possible the specific actions and mechanisms required to implement the strategy including specific actions and activities required to achieve objectives, responsible agencies and organisations, and timetable for implementation. Relevant ongoing or proposed activities and projects, such as the Transboundary Biodiversity Project (World Bank/GEF) are incorporated into the plan. Future projects and donor assistance will occur within the context of the plan. The action plan also includes a systematic monitoring mechanism to provide a meaningful measure of progress and effectiveness of implementation and its reporting.

### **Strategy and Action Plan Implementation**

Operational Context and Responsibilities: Approval of the strategy and action plan is given by the Cabinet of Ministers of Uzbekistan following review and clearance by the Biodiversity Steering Committee and the Deputy Prime Minister responsible for the Environment - at this time it becomes the official policy of the Government of Uzbekistan. A National Biodiversity Action Plan Implementation Committee will be established and will become directly responsible for organising action implementation and progress monitoring and review.

Timetable and Review: The strategy is for a 10 year period (1998 to 2007) with a detailed review being carried out after the initial 5 year period. This review will consider progress in implementation of the strategy / action plan and, if necessary, revisions required to incorporate new approaches or address changing circumstances. Starting from that time, initial planning of actions for the following strategy phase (2007 to 2017) will also be carried out to ensure continuity of action.



# Part 1. Conditions and Provisions for Developing National Strategy for Biodiversity Conservation

## INTRODUCTION

### 1. What is Biodiversity ?

The term “biological diversity” or “biodiversity” is a comparatively new one and as such is not as yet widely known. In brief the term refers to the variety of all life on earth, plants animals and micro-organisms, the genes they contain and the ecosystems they form. Biodiversity is not a static concept but recognises the inter-relatedness of all parts of the biological world. It is often considered at three levels: *diversity of species* - the diversity of all plants and animals, including fungi and micro-organisms; *genetic diversity* - the variety of genetic material within species; and *ecosystems diversity* - the variety of ecosystems (e.g. mountain forests steppe or Savannah, deserts etc.). Together these three form the components of biodiversity.

Biodiversity is a source of significant economic, aesthetic, health and cultural benefits which form the foundation for sustainable development. However, there is general scientific consensus that the world is rapidly becoming less biologically diverse in terms of genes, species and ecosystems. The reason for this is clearly anthropogenic. The scale of human impacts on biological diversity has been increasing exponentially primarily because of world-wide patterns of consumption, production, trade; agricultural industrial and settlements development; and human population growth.

Neither the economic nor the ecosystem value of biodiversity is as yet well understood. In particular, there is insufficient knowledge of the interdependence of species within ecosystems and the impact of the extinction of one species on others. As the world enters the 21st century, reducing the rate of biodiversity loss and conserving still existing biodiversity as the basis of sustainable development remain major global challenges.

### 2. Biodiversity Importance Internationally and in Uzbekistan

Biological diversity is a vital resource for human beings, both for the global community and for each nation. It is at the heart of economic productivity and livelihood today and its conservation and rational use an absolute necessity to achieve sustainable development. In addition, its protection and maintenance is an insurance policy for future generations - even forms of life that may appear to

provide no human benefit now may become important as conditions change over the coming centuries.

From both wild and domesticated components of biodiversity, humanity derives all of its food and many of its medicines and industrial products. Economic benefits from wild species alone make up an estimated 4.5% of GDP of industrialised countries such as the USA. For less developed countries this proportion can be much higher. The current commercial value of domesticated plant and animal species is even greater - for example in Uzbekistan agricultural production accounts for up to 45 % of GDP. Many benefits, particularly in less developed countries, may not be well represented in purely economic terms but are nonetheless critical for peoples livelihoods. For example, in Ghana three out of four people look to wildlife for most of their protein and for almost 80% of people in developing countries traditional medicines from the wild form the basis of primary health care. Even in modern pharmaceuticals, around one-fourth of prescriptions contain active ingredients extracted from plants and this probably represents only a small proportion of potentially useful substances not yet discovered.

Biological diversity in its totality forms the living biosphere in which human beings, along with all other species, inhabit and depend upon for their survival. In the remote past, human actions were trivial when set against the dominant processes of nature. This is no longer true and as the human race approaches the close of the 21st Century it is clear from threats of climate change, desertification, land degradation, etc., that at both a national and global level, we are using up and destroying the very basis of our future survival. The Aral Sea Crisis epitomises the outcome of inappropriate development in the Central Asian Region and the danger this represents for nations and the globe as a whole.

### 3. The Biodiversity Convention and Uzbekistan

In the past, biodiversity protection was not a significant concern in the development programmes of most countries. In recent years, however, that has begun to change as a widening understanding and appreciation of the problems faced in the world and importance of biodiversity in that context has developed. Today, the protection of biological diversity has become a recognised priority on the global agenda and thus

also within the development goals and plans of nations.

A key step in this direction is the Convention on Biological Diversity, which was signed at the 1992 UN Conference on Environment and Development (“Rio Earth Summit”) by 156 countries. It entered into force as international law in 1993 and by the end of 1995, nearly 120 nations had ratified the convention, including Uzbekistan. The central objectives of the convention are:

- 0 to conserve the diversity of the Earth’s biological resources, whether terrestrial or aquatic, including plants, animals and micro-organisms
- 0 to ensure that countries use their biological resources in ways that are sustainable in agriculture, forestry and fisheries
- 0 to promote the fair and equitable sharing of genetic resources and the benefits that result from them.

The convention requires governments to take action to ensure that their management and development of natural resources is constant with the protection and sustainable use of biodiversity. This involves assessing national economic structures and policies to determine how to build economic arrangements which promote conservation and sustainable use. In addition the Convention stipulates that the Parties to the Convention - i.e. those countries whose legislative bodies have agreed to be bound by the treaty - must take a number of actions, including:

- \* development of national strategies for conservation and sustainable use of biological resources
- \* promoting public education and awareness
- \* establishing training and research programmes
- \* providing due recognition of biodiversity issues during development via the Environmental Impact Assessment process (EIA)
- \* promoting technical and scientific co-operation between parties.

#### **4. National Biodiversity Conservation Strategy and Action Plan**

**Background:** In 1995, in recognition of the importance of biodiversity resources to its sustainable development, Uzbekistan **become** a party to the International Convention on Biodiversity. In accordance with the policy of the

Government of Uzbekistan and its priority obligation under the convention, the Republic initiated a project to develop a national biodiversity strategy and action plan which was being supported by UNDP and the Global Environmental Facility (GEF). Project implementation included participation of stakeholders in national and local government, NGO’s and was implemented by the State Committee for Nature Protection. The National Biodiversity Conservation Strategy and Action Plan document will also act as Uzbekistan’s first National Report to the International Conference of Parties (by 31<sup>st</sup> December 1997)

**Purpose and Scope:** The purpose of the national biodiversity strategy is to provide an overall unified policy and planning framework for the management of biodiversity resources in the country. All future activities in this field should therefore fit within this agreed framework. The creation of the strategy will provide clear direction for national planning and also a mechanism for ensuring well targeted and effective programme / project development. In addition it will provide donors with a clear framework within which to provide assistance. By necessity the scope of the biodiversity strategy is limited to those issue with direct relation to biodiversity conservation and use in the country. Indirect issues, such as water management, though they may be of critical importance to biodiversity, are not specifically addressed as these fall under the coverage of other sectorial plans / programmes.

**The structure of this document.** The document consists of three parts and an appendix.

The first Part: Conditions and Provisions for Developing National Strategy for Biodiversity Conservation includes: an introductory section detailing the international context, a section outlining the socio-economic and land use background; a section summarising the status and value of biodiversity in Uzbekistan; and a final section describing the legislative and institutional context for its protection and sustainable use.

The second part: the National Biodiversity Conservation Strategy, which includes a brief analyses of previous information, national goals, objectives and means to achieve them, and the strategy text itself.

The third part: the National Biodiversity Conservation Action Plan, elaborates on the strategy described above and includes details of

concrete actions required to achieve objectives, responsible institutions or parties, and a timetable for actions.

The national strategy and action plan were prepared using a multi-disciplinary, integrated and participatory approach. The project involved government and public sector stakeholders from: forestry, protected areas, agriculture, water management, scientific community, planning and NGO's. Wide participation in the process of developing the BCSAP was achieved through the holding of workshops in the various sub-regions and with the various types of stakeholders (local governments - khokimiyats, local representatives of national authorities, NGO's, etc. International consultants were utilised to provide guidance, training and technical inputs during the process of developing the BCSAP. The methodology for the implementation of the project will be based where appropriate or feasible on the "Guidelines" for Country Study on Biological Diversity (UNEP, 1993), the Guide to the Convention on Biodiversity Convention (IUCN, 1994) and the Guidelines for Preparing Biodiversity Strategies and Action Plans (WRI/IUCN/ UNEP)

**Implementation Arrangements:** The State Committee for Nature Protection (SNCP), the project executing agent, established an inter-institutional steering committee, composed of representatives of relevant authorities including: SCNP, State Committee for Forestry (SCF), Ministry of Agriculture and Water Management, Academy of Science, Ministry of Macro-Economics and Statistics, Fishery Corporation 'Uzryba' and a representative for NGO's.

A project co-ordinator was appointed, who, under the overall supervision of the steering committee, managed a multi-disciplinary "Implementation" team composed of specialists/professionals from the above and other biodiversity-relevant organisations. This broad based representation has ensured that the biodiversity strategy was developed on a multi-sectorial basis and should become a part of the mainstream efforts of the government to achieve sustainable development.

## **5. The Relationship of the Biodiversity Strategy and Other Processes and Activities in Uzbekistan**

Since independence from the Former Soviet Union (FSU) Uzbekistan has been undergoing fundamental economic, political and social changes. Some of the greatest challenges for the

new Republics, and particularly Uzbekistan, has been to address the legacy of critical environmental and land use problems that resulted from the unsustainable policies of the FSU in the region. In response to these challenges a number of national and regional initiatives, almost all of which have direct or indirect implications for biodiversity, have been set in motion. These include:

National Action Plan for Environment Protection and Ecological Provisions for Uzbekistan's Sustainable Development (NAPEESD): This is currently being prepared with the assistance of the World Bank. The biodiversity strategy will be incorporated into the NAPEESD as one of its major components. The NAPEESD will ensure a unified approach to environmental planning and that its components will be interrelated and supportive.

The National Sustainable Development Commission (NSDC): The NSDC, which is currently being established with the assistance of UNDP, will shortly be responsible for guiding the future sustainable development within the Republic. Part of its responsibilities will include initiating policies, strategies and action plans to achieve sustainable development, monitoring their effective implementation, and their review, revision or updating. Therefore central to their responsibilities will be the effective and integrated implementation of the Rio "Earth Summit" conventions to which Uzbekistan is a signatory. A major instrument for achieving the above will be the NAPEESD, including its biodiversity component.

International Conventions on 'Climate Change' and 'Combating Desertification': A GEF project to carry out a country study on climate change in Uzbekistan is ongoing with UNDP assistance and preparations to produce a national desertification action plan are underway with "UNEP/UNDP support. Both of these have a significant overlap and interrelation with the biodiversity issues and unified actions on all three sectors should ensure concrete progress for addressing critical environmental problems in the Republic. However, it is important to ensure co-ordination and synergy of action.

Transboundary Biodiversity Project (Western Tien Shan Mountains): This is a GEF/cost sharing project for approximately US\$ 10 Million currently being prepared by the World Bank/Governments of Kazakhstan, Uzbekistan and Krgyzstan. Briefly the project will have the following basic

components: a. Development of Biodiversity Strategy & Action Plan for Krgyzstan Republic (the BSAP for Kazakhstan and Uzbekistan being prepared with assistance of UNDP); b. Strengthening of policies, regulations, and institutional arrangements; c. Development of programmes to support the sustainable use of natural resources by local communities in the W. Tien Shan; d. Development of financing mechanisms, capable of duplication in the region, which will assist protected areas in meeting recurrent costs; e. Encourage regional co-operation and harmonisation of environmental standards.

Implementation is envisaged as beginning in mid 1998. This corresponds closely with the completion and official approval for the National Biodiversity Strategy and the estimated start of the Biodiversity Action Plan for Uzbekistan. The National Biodiversity Strategy will provide the necessary strategic and institutional framework for the Transboundary project implementation, which in turn should ensure that the momentum engendered by the development of the Strategy and Action Plan is maintained and practical results realised. The Transboundary project will therefore be highly beneficial in helping to bring about the critical move from policy development to action.

Aral Sea Programme (World Bank/UNDP/UNEP): The programme is intended to address the long term water and land use management problems of the region while in the short / medium term providing support to address the immediate needs of populations within the worst affected areas. In addition to the long term implications the programme has for more rational natural resource management in the region there are also three programmes with specific importance to biodiversity in Uzbekistan, namely Sub-programmes: 4.1 - Amu-Darya Delta Wetlands Restoration; 4.3- Environmental Studies (including biodiversity assessment); and 6 - Integrated Land and Water Management in the Upper Watershed.

Lake Sudoche Wetlands Restoration Project (GEF/World Bank): This proposed project forms a component of the Aral Sea Program and is ensuring the preservation / restoration of the Lake Sudoche Wetlands area in Amu Darya delta so as to conserve important and highly endangered biodiversity, improve socio-economic conditions in the area (grazing, fishing, muskrat and other wildlife harvesting and improved drainage of farm lands), and improve regulation of drainage water discharges through a major collector canal. The Lake Sudoche area is of particular value for

migratory birds (West Asian Flyway) and is proposed as a potential Ramsar Convention site.

National Environmental Information Network For Uzbekistan (UNEP/GRID - Arendal): As part of their Environment and Natural Resources Information Network (ENRIN) in Countries in Transition programme GRID-Arendal are assisting the governments of Central Asia in the development of National Environmental Information Networks. In Uzbekistan an initial assessment has been completed and a feasibility study, is underway. In addition to national efforts a regional Environmental Information Network for the Aral Sea Basin is being developed within the Aral Sea Programme. Currently, one of the major problems for effective environmental planning, including biodiversity planning, is the lack of accessibility to unified and accurate data for decision makers. The above projects will therefore be of enormous value for biodiversity conservation and sustainable use planning in the future.

Nuratau Biosphere Reserve Proposal (NABU): The German Federation for Nature Conservation (NABU), an international NGO which has many years of experience working in protected areas in Central Asia, including the Nuratau Strict Nature Reserve in Djizak Oblast, is working together with the state organisations responsible (State Committee for Forestry and State Committee for Nature Protection) to “preserving or restoring nature in the Nuratau Nature Reserve and adjacent district, and promoting sustainable economic development and ecological development of the region”. For this purpose, the Uzbek parties involved commit themselves to submitting application documentation to UNESCO for certification as an international biosphere Reserve by the end of 1997. If implemented, this project, like the Western Tien Shan Biodiversity Project (see above), will be important in putting strategic objectives into concrete actions and providing practical and tested models for other areas in the country.

Kazakhstan and Krgyzstan Biodiversity Strategy: Both Kazakhstan and Krgyzstan will be producing National Biodiversity Strategy and Action Plans shortly (1998) and it is assumed Turkmenistan and Tajikistan (political conditions allowing) will follow in the future. Clearly, it is important that every effort should be made to ensure the integration and compatibility of each country's plans and ideally an integrated regional biodiversity strategy and action plan could be feasible in the long term future.

Action Plan for the Sustainable Development of Tourism in Uzbekistan Project (UNDP): This project which started in 1995 is intended to provide the guidance for the controlled development of tourism through the preparation and implementation of an action plan and constancy assistance in the areas of policy direction, infrastructure development, international marketing and training. Important considerations are to improve the institutional structures / staff capacities and also to provide a framework conducive to attracting private sector investment / involvement in tourism. This project has some important implications for protected areas management, and the potential economic benefits that can be gained from rational utilisation of biodiversity resources, as it will provide for a more workable situation within the country to develop appropriate eco-tourism.

# GEOGRAPHICAL AND SOCIO-ECONOMIC CONTEXT

## Introduction

The purpose of this section of the document is to provide the context in which biodiversity exploitation, regulation and conservation is occurring in the republic. This is essential if a correct understanding of the current situation for biological resources is to be grasped and if the inter-relationship between the economy, production systems, social situation, and environmental conditions, are to be understood.

## 1. Description

The Republic of Uzbekistan is situated in the central part of the Eurasian continent between 37° / 45° latitude North and 56° / 73° latitude east, within the subtropical zone of the northern hemisphere. The territory covers approximately 447,100 km<sup>2</sup>. and is bordered by Kazakhstan to the north, Turkmenistan and Afghanistan to the south, Krgyzstan and Tajikistan to the east. The Republic is divided into 12 main administrative areas (oblasts) and the semi-autonomous Republic of Karakalpakstan in the north-western part of the country.

Almost 85% of its territory is occupied by desert or semi-desert, including the largest desert in Central Asia, the Kyzylkum. These deserts are flanked by the extensive Tien Shan and Gissar-Alai mountain systems in the east and south-east which occupy 15% of the territory. The main water arteries are the transboundary rivers. the Amu-Darya and the Syr-darya, which deliver their waters into the Aral Sea, a large part of which is within the territory of the republic. These rivers are flanked by broad, flat valleys which are intensely utilised for irrigated agriculture.

**Climate:** The climate of Uzbekistan is described as subtropical extremely continental with considerable seasonal and daily fluctuations of temperature-long dry hot summer, humid autumn and fluctuating weather in winter. The interaction of three main factors are responsible for this climate, namely - solar radiation, general atmospheric circulation. and topographic relief. Solar radiation is particularly high, reaching up to 800 to 1,000 Mj/m<sup>2</sup> in summer months. Winds are normally from the north-east, east or south-east in winter, and north, north-west or north-east in summer.

There are three main climatic zones in Uzbekistan: deserts and dry steppe, foothills, and mountains.

Nearly all the deserts and steppes lie below 400 above sea level including the Kyzylkum Desert, the Usturt Plateau, and the Karshi and Dalverzin Steppes. Average precipitation in these areas is less than 200 mm per year. The maximum precipitation occurs in March and April, the minimum in August and September. Winter is fairly short, about 2 months in the south and 5 months in the north, and produces little snow cover (2 to 11 cm). Average temperatures in January are 30°C in the south (Termez) and -80°C in the north (Usturt). However temperatures can fluctuate very widely (between maximum of 20°C and minimum of -37°C). The frost-free period lasts between 190 and 200 days a year, but can be as short as 160 days in the Usturt Plateau in the far north. Spring is usually short and early, with the growing season beginning in early March in the south and late March / April in the north. Summers in the deserts and steppes are long, hot, and dry. The maximum temperatures recorded in summer are between 45° -49°C and soil surface temperature can reach up to 60-70°C.

The foothill zones surrounding the Tien Shan and Gissar-Alai mountain vary from about 300 to 1,000 m above sea level. Annual precipitation in the foothills reach about 400 mm per year. Similarly to the deserts and steppes: rainfall is at its maximum in March April and at a minimum in August and September. The foothills zone is more temperate than the desert and steppes, with average monthly temperatures of 26° to 28°C, and maximum daytime temperatures of about 45°. The frost-free period is on average between 2 10 and 240 days per year, but may be as long as 260 days in the south.

The mountain zone vary in altitude between about 1,000 and 4,000 m above sea level. Precipitation in this zone occurs throughout the year but is highest during May and June. In some areas average annual rainfall is above 800 mm, and as much as 2,000 mm has been recorded. Snowfall usually occurs at altitudes of 800 / 1,000 m and above. The total snowfall is about 500 cm per year. Above 3,500 to 4,000 m snow cover may last continuously.

Precipitation in all zones can show great variability between years (from twice as much as average to three times less).

## 2. Economic Factors

**Key Indicators:** The GDP of Uzbekistan was estimated to be \$54.5 billion (based on extrapolation from World Bank estimates for

1992). Between 1990 and 1994 GDP declined (the real growth rate was

these countries amounted to \$1.15 billion (\$207.3 million deficit).

*Table A: Basic Facts about Uzbekistan*

Geography	
Location	Central Eurasia
Area	447,000 km <sup>2</sup>
Climate	Subtropical extremely continental
Capital City	Tashkent (pop. 2.2 million)
Largest Cities	Samarkand, Andijan, Bukhara
Demographic indicators (1993)	
Population	22.2 million
Population growth rate	2.3%
Life expectancy	69 years (69.3 rural, 71.2 urban)
Ethnic distribution (1993)	
Uzbek	74.5%
Russian	6.5%
Tajik	4.8%
Kazakh	4.1%
Education (1994)	
Literacy rate	97.7% (98.12% rural, 99.8% urban)
Access to basic health infrastructure (1994)	
Access to water	72.6% (60.2% rural, 85% urban)
Access to sanitation	47% (40% rural, 54% urban)
Access to gas	61.4% (43.8% rural, 79% urban)

*Table B: Summary of Economic Indicators*

<b>National Product (GDP)</b>	
GDP	\$54.4 billion
Per capita GDP	\$2,370 (1994, assessment by purchasing capacity parity. World Report, the World Bank, 1996, p. 252)
Share of industry in GDP	22.3% (1993), 17.0% (1994), 17.1% (1995), 17.4% (1996)
Share of agriculture in GDP	27.8% (1993), 34.5% (1994), 28.0% (1995), 22.5% (1996)
Real growth rate	-0.9% (1995) 1.6% (1996)
Inflation and Unemployment	
Annual inflation rate (consumer prices)	534% (1993), 1522.5% (1994), 304.6% (1995), 54% (1996)
Official unemployment	0.2% (1993); 0.3% (1994), 0.37% (1995), 0.39% (1996)
Exports	
Total to non-FSU countries	\$942.7 million
The share of non-FSU countries in export	77.1% (1996)
Main exports	Cotton, gold, energy sources, mineral fertilisers, machinery and equipment, non-ferrous metals, food products
Main non-FSU partners	
Imports	UK, USA, Switzerland, Korea; Netherlands, China
Total from non-FSU countries	\$ 1.15 billion
The share of non-FSU countries in import	67.9% (1996)
Imported commodities	Food products, machinery and equipment, chemicals, plastics, ferrous and non-ferrous metals
Main non-FSU partners	
Industry (1996)	Germany, USA, Turkey, Korea, UAE, UK, Switzerland
Main industries	
Industrial growth rate	Fuel and energy, machine building and metal-work, light industries, food processing, metallurgy, chemicals 6%
Agriculture	
Main crops	Cotton, grain; vegetables, fruits, grapes
Agricultural growth rate	7% (1997)

estimated to be -3.5 % in 1994 and -0.9% in 1995) but became positive in 1996 (1.6%). The inflation rate peaked in 1994 at approximately 1,522% per annum, but this declined to 54% by 1996. In 1994, exports to countries outside the Former Soviet Union totaled \$942.7 million, while imports from

Industrial production in 1996 grew by an annual rate of 6 % and agricultural production, after an initial decline of about 1.5 % between 1991 and 1994 moved into positive growth of about 7% in 1997. The official unemployment rate is low (0.39 %). In addition there is a significant proportion

of under-employed (perhaps 8%), particularly in rural agricultural areas.

Description: The economy of Uzbekistan is dominated by agriculture which accounted for 44% of the national Net Material Product (NMP) in 1994 and 22.5% of GDP in 1996. It employs the majority of the labor force (41.2%) and comprises about 60% of total exports. Owing to the geographical / climatic situation of the country only 10/11% of land is cultivated. There is a very high dependence on irrigated agriculture with 95% of all cultivated land being irrigated. An estimated 85% of available water resources is utilized for this purpose. In addition, the agricultural sector is heavily dominated by the production of raw cotton which in 1991 utilized approximately 70% of cultivated land and represents about 80% of the country's exports. However, in 1996 this had been reduced and cotton utilized 35% of irrigated land and constituted 38.1% of total exports. Only a small proportion (15%) is processed locally. Other important agricultural crops include fruit/vegetables, wheat and rice. A process of crop diversification has started with a reduction of cotton in favor of grain crops. As a result land under grain production increased from 29% in 1992 to 35% in 1996. However the country has not fully attained self sufficiency in foodstuffs yet and still relies partially on imports for grain, meat and milk

In addition to cotton, Uzbekistan is a substantial producer of other textile raw materials including silk and wool/astrakhan. Production of silk cocoons in 1996 equaled 30,000 tons of which 30% was exported.

Industry accounted for 17.4% of GDP in 1996 and nearly 13% of employment. Heavy industry represented 41% of the total industrial output in 1991, against 39% for light industry and 13% for agro-food processing. A growth rate of 6% was recorded in 1996. Leading industrial products were agricultural and textile machinery, textiles, aircraft and energy.

Uzbekistan is endowed with rich mineral resources and has deposits of oil, gas, gold, silver, copper, lead, etc. There are 27,000 deposits/fields identified in the country, 900 of which are explored. Uzbekistan also has substantial energy resources including 74% of gas condensates in Central Asia, 31% of oil, 40% of gas and 55% of coal. Currently, 85% of energy is generated by thermo-electric stations and 15% by hydro-electric sources. The country has tripled production of oil

since 1990 to 7.7 million tons and increased gas production by 20% to 49 billion m<sup>3</sup>. By doing so self-sufficiency in energy production has been achieved and the potential for substantial exports developed.

Economic Transition: In 1991 Uzbekistan declared its independence from the Soviet Union. At that time the economy of Uzbekistan, as part of the centrally planned Soviet system, was tightly integrated into those of other Republics. Prior to independence, inter-republican trade, both "exports" and "imports" accounted for 86% of Uzbekistan total trade which in turn represented 67% of GDP. The Uzbek economy as a whole was also heavily reliant on resources channeled from the federal budget of the Soviet Union. Budget transfers to Uzbekistan were the highest in the Union and equaled 19.5% of GDP in 1991. Thus, at independence Uzbekistan confronted a pattern of difficulties common to all the newly independent states, including the loss of transfers from Moscow and the inheritance of a highly monopolistic structure of production. The crisis was further compounded by the severance of inter-republican trade links.

In response, Uzbekistan has been forced to undertake a systematic transformation of its economy, polity, and society. An important aspect of this transformation is the transition from a central planning to a more market orientated economy. Initially the reform process proceeded rather slowly but recently the pace has accelerated. So far Uzbekistan has been more successful than many other CIS countries in preventing sharp falls in outputs and incomes and an increase in poverty. The gradual approach of the government foresees three steps: i. arresting any further decline in production ii. attaining macro economic stabilization as a basis for resumed growth; and iii. creating the conditions for sustainable growth.

Although the first years of transition have not been easy ones, the decline of the Uzbekistan economy since 1990 has been relatively small compared to that of other CIS States, particularly surrounding countries such as Azerbaijan, Armenia, Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan. Uzbekistan has not had a positive economic growth rate since independence, but it remains higher than many other Former Soviet Union countries and has showed a generally increasing trend in recent years.



### 3. Human Population

Uzbekistan is the most populated country of Central Asia, and ranks third in the CIS in population, behind only Russia and Ukraine. By the beginning of 1997 the population has reached 23,349,500. The most outstanding demographic feature of Uzbekistan is high birth-rate. Annually about 640,000 to 650,000 children are born in Uzbekistan, resulting in a population growth rate of 2.3% per year with birth-rate in rural areas being 40% to 50% higher than in the cities. The population doubling time is 30 years.

the environment. Miscalculations were made over a long period of the economy's development in the allocation of resources and development of production. As a result, the Republic is faced with a severe deterioration of its ecological situation.

A distinctive feature of the Republic has been the excessive development of the agricultural sector on the basis of the extensive use of irrigation technologies and a cotton monoculture. The processes of urbanization and industrialization were hampered as a result of this imbalance.

Since the majority of the cultivated land was

Figure A: The ratio between city and rural population and distribution of population by age

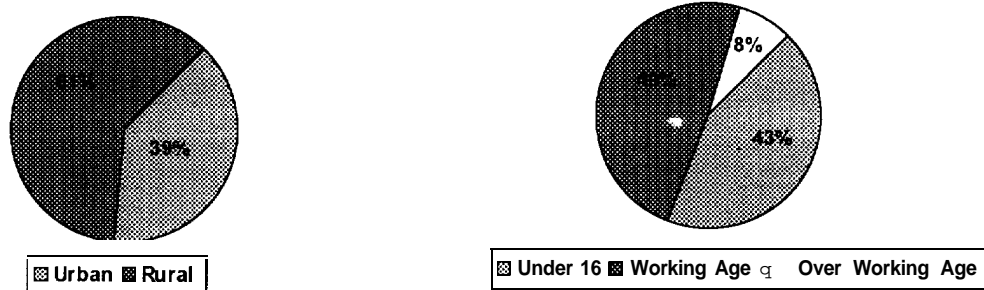


Table C: Population Density and Percent of Rural Population by Region (1994)

	Population Density (people/km <sup>2</sup> )	Rural Population as % of total
Uzbekistan (total)	49.6	61
Karakalpakstan	8.3	51
Andijan	464.6	70
Bukhara	32.7	67
Dj izak	41.6	68
Kashkadarya	65.8	74
Navoi	66	60
Namangan	215.1	62
Samarkand	145	71
Surkhandarya	71.6	81
Tashkent	121	58
Fergana	337.7	70
Khorezm	<b>1856</b>	<b>75</b>
City of Tashkent	6382.4	

### 4. Environmental Policy and Management in Uzbekistan.

#### *Environmental Legacy of Soviet Union in Uzbekistan:*

As part of the former Soviet Union, the Republic of Uzbekistan was subjected to a highly centralized approach to its social and economic development, which gave little regard to the impact of policy on

allocated to cotton and rice growing there was a high demand for new land development, irrigation network construction, and river flow regulation. This unsustainable pattern of agricultural development was the main contributor to the present water crisis. The irrevocable overuse of water resources resulted in the sharp reduction of the flow of the rivers Amu-Darya and Syr-darya to the Aral Sea, which has dramatically shrunk as a result.

The current ecological situation in Uzbekistan is the result of past misguided policies such as:

- \* prioritized development of large scale and highly concentrated production systems placing excessive pressure on local environments;
- \* highly centralized bureaucratic decision-making that did not, in practice, allow the termination or reorientation of ecologically dangerous production systems;
- \* lack of direct competitive pressure from the world market and, as a result, outdated and inefficient technology, equipment and organization of production;
- \* inaccessibility of information on the qualitative and quantitative situation of natural resources, and as a result the inability to make informed decisions.

Retrospective analyses show that quite a number of planned ecological programmes were not implemented at all or were implemented only partially. In 1991 central government expenditure on environmental protection still only equalled about 0.06% of gross national product (this compares with France which spends close to 7%). To address this situation, the Programme for Preservation of the Environment and Rational Management of Natural Resources was developed in 1991 for the period from 1993 to 2005. This programme includes a long term strategy and outlines the basic tasks needed to improve ecological conditions in the Republic. All the environmental protection activities in the last four years have been in accordance with this programme.

### ***Current Environmental Policy and Management.***

Uzbekistan's independence and integration into the world economy and political system have provided a powerful incentive for achieving greater human welfare for its people and for the solution of its pressing ecological problems. The protection of the environment in the Republic is considered an integral part of the whole process of economic reforms. The social and economic policies of the state are based on the principles of achieving harmonisation of production and environment, and promoting awareness of the gravity of the country's ecological problems.

The ecological safety of citizens is now guaranteed by the Constitution of the Republic. Environmental legislation has established economic and social provisions for the ecological security of the population, on the basis of generally accepted principles of environmental protection and

rational use of natural resources. According to Article 55 of the Constitution, land, water, wildlife, plants, and other natural resources are all part of the country's national wealth and therefore must be protected by the state.

An appropriate level of funding for ecological programmes is to be attained through the central budget. a system of regional foundations for the protection of nature, non-governmental ecological funds, and new finance and credit mechanisms developed within the context of the transition to a market economy.

## ***Land Use and Water Resources***

### ***Introduction***

As a result of the historic absence of an integrated approach to natural resource management, comprehensive figures for land use in Uzbekistan are not easily available. In addition, the break-up of the FSU and the separation of the Central Asian states into separate countries has led to the disruption of regional records and a confused situation along state boundaries, producing further inaccuracies / discrepancies in land use figures. However, on the basis of data made available from sources in the Ministry of Agriculture and Water Management and Gosbioccontrol, table d (below) has been prepared. Though limited and incomplete in a number of areas, it provides a basic overview of the land use pattern in Uzbekistan and the value for biodiversity of different land uses.

### **1. Overview of Land Use in Uzbekistan**

According to information from sources in the Ministry of Agriculture and Water Management the Republics total land resources equalled 44,579 km<sup>2</sup> in 1995. Out of this total area, 61.5% was in agricultural use, 3.6% was under forestry, 2% was made up of permanently protected areas, 26% was unused and the remainder (6.9%) was utilised for urban areas (0.5%), hydro-technical installations (1.5%), industry, transport and other non-agricultural purposes (4%).

In terms of agricultural land use the vast majority (82% of agricultural land) was utilised for livestock as pasture or hayfields, with the remainder being cultivated. Cultivated agriculture utilises 10.8 % of the total land area of the Republic, the remainder being other plantations, desert, orchards and lands under forestry administration. About 69% of the total area of cultivated land was irrigated.

Table D: Summary of Land Use and Value for Biodiversity

Land Use Category (LUC)	Secondary Land Use Classification	Land Area (km <sup>2</sup> )	% of Total Land Area	Biodiversity Quality Category	% Rate of Change (over 10 years)
Arable	Cultivated Irrigated	33,344	7.5	v low	-4.4
	Cultivated Non-irrigated	7,379	1.7	v low	-3.4
	Fallow	692	0.15	low	+3.7
	Household Plots/private land	6,015	1.35	low	+15.1
	Land being reclaimed	753	0.17	v low	-4.5
Total Cultivated		48,183	10.8		+2.5
Permanent meadows and pastures	Irrigated hayfields and pasture	420	0.1	low	+0
	Non-irrigated hayfields and pasture	224,611	50.5	medium	-4.5
	Total hayfields and pasture	225,031	50.6		-4.5
Total Agricultural		271,854	61.5	low - v low	-5.7
Forestry	Irrigated Plantation & orchards	3,610	0.8	low	+16
	Non-irrigated Plantation & orchard	135	0.03	medium	+19
	Natural Forest and Shrubs	12,547	2.8	high	-10.7
Total Forestry		16,292	3.6	medium	-5.6
Permanent Protected Areas *	National Parks	6,061	1.3	high	
	Zapovedniks & Biosphere Res.	2,110	0.5	v. high	
	Others **	773	0.2	high	
	Total Permanent Protected Areas	8,944	2	high / v high	
	Industrial, transport and other non-agricultural use	18,415	4	low	
	Hydro-technical and other water installations	6,542	1.5	Low / medium	
	Urban areas	2,212	0.5	v. low	
	Unused land	118,830	26.7	N/A	
	Total Irrigated Land	42,979	9.7		
Total Area		444,522	100		

\*Sot including Zakazniks \*\*Natural Monuments, Ornithological Reserve

- 57,846 ha and lowland forestry - 7 1,147 ha

Forestry: a of the state-owned forestry land equals 8,285,301 ha including:

- Forestry (lands actually covered with, or potentially suitable for, forests - 4,492,071 ha;
- non-forestry (lands not suitable for forests or used in agriculture, by industries, etc.) - 3,793,230 ha.

Forestry in sand areas takes up 6,971,250 ha, mountain forestry -1,185,058 ha, riverine forestry

The hydro-technical and other water installations category includes canals and related water management infrastructure but not medium / large water bodies and lakes. However according to separate data from the State Fisheries organisation, productive lakes and water bodies cover 6.761 km<sup>2</sup> or about 1.5% of the country. In addition the Aral Sea, though approximately half its original size, still occupies about 16,500 km<sup>2</sup> of Uzbekistan territory or 3.7%

### ***Biodiversity Quality of Different Land Use Categories***

The biodiversity quality of all cultivated areas is reportedly low or very low due to the almost total destruction of original habitats during irrigated field construction, the very high use of agro-chemicals, monocultural agricultural systems, high salinity and the invasion of a limited number of highly competitive agricultural weeds. In the majority of the pasture land, where extensive livestock systems are used, natural ecosystems and habitats have been significantly altered due to grazing pressure, but retain a component of original wild species. However, competitive pressures, particularly with larger mammal species has led to their serious decline and even extinction.

The biodiversity value of irrigated plantation forestry and orchard areas is comparatively low mainly because they are located within areas of intense irrigated cultivation and thus suffer the same limiting factors. The biodiversity quality of lands with natural vegetation or under permanent protection is said to be high/very high. In particular Zapovedniks, under strict protection, retain the most intact habitats. However, the limited size of many, the long distance between them and the deteriorated general situation makes it extremely likely that ecosystems are declining even inside their boundaries.

The biodiversity of industrial, transport, urban areas, and hydro-technical installations is thought to be generally low due to various negative implications of human activity.

It is unknown what is the biodiversity quality of the category “unused land”.

### **2. Agriculture**

As indicated above, about 6 1% of the total land

area of Uzbekistan is used for agricultural purposes. However the vast majority (82% of agricultural land) is utilised as pasture for livestock and only about 18% of agricultural land is used for arable agriculture. As with other sectors of the economy, agricultural production was in the past managed in a highly centralised way. Government policy since independence has been aimed at addressing this through the introduction of free market conditions for inputs and marketing.

### **Arable Agriculture**

This sector is almost entirely dominated by irrigated agriculture which yields over 95% of the total crop production in the Republic. Since 1960 the predominant crop grown in Uzbekistan has been cotton, which occupied between 40 and 60% of irrigated land. Other important crops include grain (wheat, barley, maize, sorghum), livestock fodder, potatoes, vegetables and melons.

In 1991 allocation of land for different crops equalled 41% for cotton, 26% for grains, 25% for fodder, and 8% for vegetables /other crops.

*Agro-chemical.* Over the recent years pesticide use in Uzbekistan has plummeted (**Error! Reference source not found.**,

table e: application rates of pesticides and defoliant (1990/1993)), mostly due to economic difficulties. **At** the present time the danger of pesticide pollution is mainly from waste water from production sites; polluted run-off from fields; air pollution through substantial dissemination of pesticides into the atmosphere; and direct application of chemicals to control algae and other organisms in water. Localised “hot spots” of pesticide contamination exist, such as spray plane airfields and pesticide storage depots / dumps.

Figure B: Pesticide Use in Uzbekistan

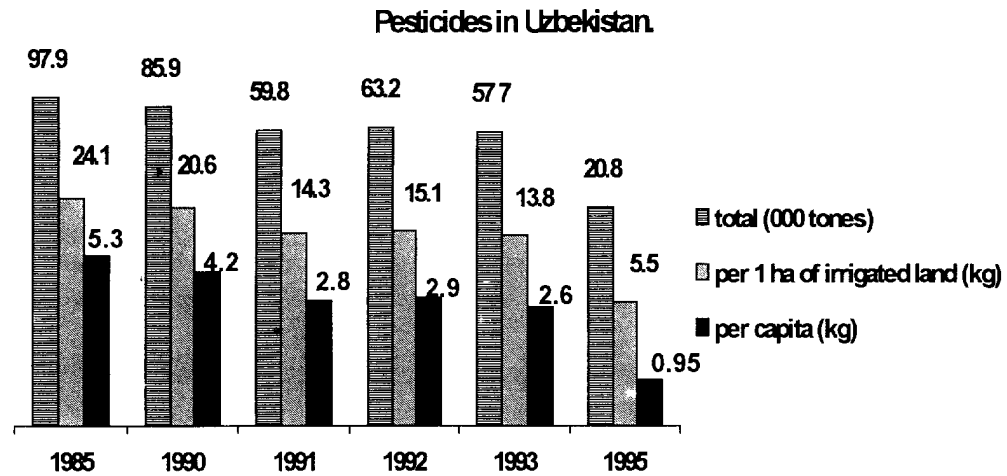


Table E: Application rates of Pesticides and Defoliants (1290/1993)

Year	Insecticides and Fungicides kg/ha	Herbicides kg/ha	Defoliants kg/ha	Sulphur Compounds kg/ha	Total kg/ha
1990	5.1	6.4	19.4	17.2	19.0
1995	2.5	12.3	18.1	26.0	14.8

**Irrigation Systems.** The most common irrigation technique in Uzbekistan is watering by furrows. Over 95% of irrigated land is supplied in this way. There is currently little use of more advanced technology such as drip or sprinkler methods, and major investment will be required to develop these on a large scale. The average on-farm efficiency of furrow irrigation is estimated at around 65%. Losses during delivery to farms via canal systems are high as most canals are unlined and evaporation rates are high. Overall system efficiency is therefore estimated by the State Committee for Nature Protection to be 50% or less.

### Livestock Agriculture

A total of 225,031 km<sup>2</sup> or 50% of Uzbekistan's territory is devoted to pasture and livestock rearing, most of it unimproved natural pasture. A small proportion of this is irrigated (420 km<sup>2</sup>). Numbers of livestock by type, along with indication of ownership are shown in the Table G, below

### 3. Forestry

Table F: Forestry Coverage

Type	Area (km <sup>2</sup> )		% total area	
	SCF	M.A.G	SCF	M.A.G
Artificial forests	5,749	3,745	0.7	0.8
natural forests	85	-	-	-
natural forest and shrub land	24,420	13,547	5.5	2.8
Grassland / desert pasture	-	224,611	-	50.5
Total	27,768.0	240,703	6.2	54

Drainage systems are extensive and an estimated 70 to 100 % of irrigated land is drained. Nevertheless serious problems with water logging and salinization are experienced.

Due to the fact that forestry management is shared by the State Committee for Forestry (SCF) and the Ministry of Agriculture and Water Management (M.A.G) and that differing data was received from both, the table below (

Table F) presents a summary of data from both sources.

Kind of livestock	Category of ownership	Number of animals (thou)	
		1993	1996
Sheep and goats	Total	10059.3	8770.5
	Private Farmer's	5143.5	5277.1
Pigs	Total	109.5	219.4
	Private Farmer's	150.4	206.6
Cattle	Total	233.0	28.0
	Private Farmer's	5.7	4.9
	Subtotal of cows	2483.3	3104.1
	Private Farmer's	1852.8	3938.6
Horses	Total	198.3	246.1
	Private Farmer's	2336.9	2282.2
Donkeys	Total	1866.1	1854.9
	Private Farmer's	59.2	66.7
Total	Total	144.3	142.5
	Private Farmer's	70.5	75.7
Total	Total	7.8	8.8
	Private Farmer's	-	-

**Distribution:** Forests are naturally unevenly distributed within the territory of the republic. According to the State Committee of Forestry, natural vegetation and forests currently occupy 85% of desert / steppe areas, 13% of mountains, and in the valleys and floodland areas, which originally were well covered, only 2% remains.

**Value and Status:** Forests and other areas of natural vegetation, as areas of economic significance, have three main values. Firstly, they are important in stabilising environmental processes (watershed protection, anti-desertification, atmospheric, etc.); secondly, part of them can be good pasture; and thirdly, they are used for collecting timber, fuel wood, nuts, fruits and other products.

Small sectors of riverside forests 'tugai' are still located along big rivers. Until recently, relatively large areas were covered with forests, but, as a result of stubbing riverside forests and river flow control, area of river side forests has decreased by more than 10 times. Indiscriminate stubbing of forests for agricultural land use was the cause of secondary salinisation of surrounding lands and aggravation of water and wind erosion problems. As a category riverside forest have suffered the greatest level of destruction in terms of the proportion lost.

As far as the mountain regions of the republic are concerned, mountain forests can be found almost everywhere. Mountain forests improve climate, control water regime, and protect soil from erosion.

Desert shrubs and other vegetation grow mostly on sandy soils. They are very important in protection of sands from blowing away and for ameliorating the strictly continental desert climate. The largest areas of steppe/desert shrub lands are located in Bukhara province and Karakalpakstan; small areas are also dispersed among Surkhandarya, Khorezm, and Syr-darya provinces and Fergana valley.

**Current Situation:** In the past, more than 2 mill. ha of forest land were distributed, on a temporary basis, to agricultural organisations that have been using these lands as pastures for decades. This has resulted in these areas losing forestry value.

The greatest losses in forestry and natural vegetation occurred between 1930 and 1980, mainly due to extensive agricultural development. After this time the speed of such losses slowed down. However the overall situation with forestry and natural vegetation cover in Uzbekistan is still unsatisfactory. For example, according to the data of national centre for space environmental monitoring, total area occupied by trees and shrubs in the Kashkadarya river basin has dropped by 12%. More than two-fold decrease in numbers of nut-fruit and fruit shrubs and other valuable species in this region is a sign of real danger.

To address this situation, in 1993 the Government of Uzbekistan passed a resolution repealing acts of long-term use of forest lands. In addition, it has decided to establish commercial plantations of poplars on 90,000 hectares, "eldar" pines - on 800 ha and walnuts - on 500 ha of low-productive irrigated lands. Rules and quotas have been established for collecting medicinal, spice-producing, and decorative plants.

Forestry policy in Uzbekistan should put a high priority on prevention of further losses in natural vegetation as well as efforts to develop the plantation forestry sector.

#### 4. Water Resource

**Surface Water:** The Amu Darya and Syr-darya drainage basins constitute almost the whole regions surface water resources. The majority of the runoff of these rivers and their tributaries is generated in their headwaters i.e. in Tajikistan or Krgyzstan. The mean annual flow of the Amu Darya is estimated as 75km<sup>3</sup> and Syr-darya Darya- 3 5km<sup>3</sup> making a mean total runoff of about 110 km<sup>3</sup>.

**Lakes and Reservoirs:** There are a large number of small artificial water bodies and reservoirs created mainly for water management purposes. The only large natural body of water in Uzbekistan is the Aral Sea. This lake, half within Uzbekistan (Karakalpakstan) and half within Kazakhstan, has been severely effected by irrigated land development and water management policies of the past. Since the 1970's the Aral has shrunk to approximately half its original size. In the area peripheral to the sea this has had an enormous impact not just on the local ecology but on the health, economy and social situation of local populations. The Aral Sea crisis has gained international publicity and attention. The desiccation of the Aral and related impacts are a graphic example of the overall unsustainability of natural resource management in the region.

In addition to the Aral Sea, there is also a large artificial water body in Uzbekistan, the Aydar-Arnasay lake system located in the north/central part of the country within the Djizak and Navoi provinces. This lake system was created in 1969,

**Groundwater:** This forms a significant part of the water resources in Uzbekistan and plays an important role in providing drinking and agricultural-use water including irrigation and pastures watering. So far 357 fresh-water aquifers have been prospected (not including mineral and thermal ones) with yielding capacity totalling 21,480 m<sup>3</sup> a day, of which 10,523 m<sup>3</sup> can be used for drinking. Out of the total number of the aquifers prospected, only 267 yielding 8,530 m<sup>3</sup> a day are used, i.e. there is a substantial reserve, particularly for development of drinking water supply in rural areas.

### Fisheries

One of the important branches of the national economy which utilises biological resources is fisheries. Up until the 1960's, the fishing industry was concentrated in the Aral Sea, with Muinak being the main fishing port. In total the Sea used to produce on average 40,000 tons per year, 25,000 from the area of sea within Uzbek territory. Following the desiccation, the sea had become of no value for fisheries. Thus there was a necessity to

Table H: Estimated Long-term Average Runoff of Amu Darya and Syr-darya Darya Rivers

River	Long-term Average Annual Flow (km <sup>3</sup> )	
	Estimate A	Estimate B
Amu Darya Basin		
Pyandj	33.35	33.35
Vakhsh	20.14	20.14
Others	22.23	22.07
<i>Total Amu Darya</i>	<i>75.72</i>	<i>75.56</i>
Syr-darya Darya		
Naryn	13.96	12.57
Karadarya	3.81	3.80
Fergana tributaries	7.63	7.65
Chirchik	7.26	6.94
Others	2.07	1.69
<i>Total Syr-darya</i>	<i>34.73</i>	<i>31.65</i>
<i>Total Aral Basin</i>	<i>110.45</i>	<i>107.21</i>

mainly due to the substantial dumping of up to 25 km<sup>3</sup> of Syr-darya Darya river's flow into a natural depression (emergency discharge). Its open water area and water volume equalled in 1969 3,000 km<sup>2</sup> and 30 km<sup>3</sup>, respectively. The water is slightly saline yet productive which means that the area has important potential for developing fisheries. In addition, it is an important wetland area for migratory birds and for continuous existence of tugai forests.

start exploring other opportunities.

As a result, stress has been put on the expanded development of the lake-and-pond fisheries using as many suitable reservoirs as possible, and particularly the Aydar-Arnasay system.

The table below (Table I) shows the total actual fishery output over the last 5 years.

introductions. For some local species (bream, pike-

Table 1: Fishery production in Uzbekistan (1992-1996)

Year	1992	1993	1994	1995	1996 (for 10 months)
Amount (tons)	7388.4	6675.4	3129.6	3611.6	3061.6

There has been a significant decline in production (about 51%) between 1992 and 1995. This was mainly due to general economic down turn resulting from financial and managerial difficulties, and, to a lesser extent, other causes such as water quality decline.

Introduction of exotic fish species: prior to the 1960's the total number of indigenous fish species registered in Uzbekistan equalled between 31 and 39. During the last 30 years there has been a lot of fish deliberately introduced and some accidental

perch, crician) introduction was confined to the reservoirs where they were not previously found. The others came from more remote regions, such as China, North America, and Siberia. Due to this, the total number of species in the country has increased up to 80, approximately. However, a number of indigenous fish species have become endangered or already disappeared. In particular a number of endemic species from the middle parts of rivers have become extinct due to changes in the special conditions required for their reproduction resulting from construction of dams and other water management structures.



# ***BIODIVERSITY OF UZBEKISTAN***

## **1. Bio-Geography, Ecosystems and Habitats in Uzbekistan**

**Introduction:** The territory of Uzbekistan is divided into two sharply different physical-geographical parts: i.e. lowlands and mountains. Within these parameters live biogeographical zones occur, which are distinguished by certain differences in the main characteristics of their ecological conditions and in composition and structure of their flora and fauna. These include:

1. Desert ecosystems of lowlands or plains
2. Piedmont semi-desert and steppe
3. Riverine ecosystems in, and peripheral to, major rivers
4. Wetland and delta ecosystems
5. Mountain ecosystems.

Each zone embraces diverse complex of natural components that condition development toward: and functioning of, certain flora and fauna associations.

## **2. Lowland Desert Ecosystems**

Uzbekistan's arid ecosystems take up the majority of the Turan lowlands and include Kyzylkum and Karakoum deserts, Usturt plateau, Karshi steppe. and separate places in the country's south and Fergana valley.

The following main categories of desert ecosystems can be found in Uzbekistan: Sand Deserts; Clay Deserts; Saline Deserts; and Stony or gypsum (detritus) deserts. All these types are located 100 m to 300 m above sea level under rather similar climatic conditions. Essential factors are average annual temperature (+11 to +18 °) and precipitation (100 to 150 mm).

The desert ecosystem, by virtue of natural peculiarities, is distinguished by a rich variety of flora and fauna. For example, flora of Kyzylkum desert totals 937 plant species, over

500 species and sub-species of vertebrates and about 950 species of non-vertebrates.

Residual heights of both Kyzylkum desert and Usturt plateau represent a major protective complex of a landscape, concentrating the richest fauna and flora complexes. In addition, there is a number of irrigation water discharge reservoirs occurring on the territories of desert ecosystems, where congregation's of waterfowl and wetland birds are observed during migrations.

The desert ecosystem is the basic habitat for many rare and disappearing animal species, such as Indian honey badger, lynx, goitred gazelle, marbled teal, short-toed eagle, imperial eagle, griffin vulture, Saker falcon Houbara bustard, and pin-tailed sandgrouse. Among rare reptiles, 5 species inhabit deserts. A number of rare bird species, totalling 15, may be considered as temporary visitors of the desert ecosystem. Beetles from desert sites in Fergana valley and the tugai butterflies have been ascribed to the list of extinction-endangered species.

### ***Sandy deserts***

These are formed on desert sandy soils and loose sands. The area of sandy contours in Uzbekistan makes 27% of the total area of a lowland part of republic. Kyzylkum is the largest sandy area of Uzbekistan,. Other areas include the Sundoukli Sands, located between the river valleys of Amu-Darya and Kashkadarya:. and the Kattakoum sandy massive in downstream part of the Surkhandarya.

The climate of sandy deserts is extremely dry and continental. The minimal temperatures occurring in winter are -36 to -32 C<sup>0</sup>, the maximum in summer, are +46 to +47 C<sup>0</sup>. Average annual temperature ranges between +12 and +14 C<sup>0</sup>. Precipitation is insignificant equalling only 75-100 mm.

Within sandy deserts of Uzbekistan there is a total of about 320 species of flowering plants

(phanerogams), relating to 3 I families and 134 genders. One hundred and seventy one species belong to real "psammophites" (40 species are as well common to gypsum deserts and 60-to foothills and bottom belt of mountains). More than 50 % of species are endemic, the rest is represented by \*Iranian-Turanian, Turanian-Caucasian, and Turanian-European elements.

The ecological and biological peculiarities of sandy habitats causes the occurrence of diverse forms. Tree-shrub plant forms are a characteristic part of "psammophite" vegetation. They make 30% of total flora composition. Several species can be named here: trees - *Haloxylon persicum*, *Ammodendron conollyi*, *Salsola richteri*, *Eremosparton flaccidum*, treelike species of *Calligonum* gender: shrubs-the shrub like representatives of genders *Calligonum*, *Salsola arhuscula*, *Ephedra strobilacea*, *Astragalus unifoliolatus*, *A. paucijugus*.

The group of perennial grassy plants is represented by ephemeral (10%) and summer-vegetation grasses (20%). Of ephemeral plants, it is necessary to note *Carex physodes*, *Poa bulbosa*, *Ferula foetida*, which frequently co-dominate in a vegetative cover. From grassy perennials-*Stipagrostis pennata*, *S. karelinii*, *S. minor*, are pioneers of fixed sands. About 40% of sandy-desert species are represented by annual grasses-ephemeral and summer-vegetation grasses.

Vertebrate fauna of sandy desert is formed by about 200 species. from which 16 are reptiles, over 150 are transiting and nesting birds and 22 are mammals. Most characteristic representatives of sandy associations are the animals of "Psammophile" species-big-eared and sandy toad agamas, mesh lizard (*Eremias grammica*) and several species of jerboas-the hairy-toed, crest-toed jerboa, Liechtenstein jerboa and Bobrinsky jerboa. Midday "peschanka" and thin-toed gophers are typical sandy forms among rodents. Among birds, about 50 species are adapted to survive in conditions of sandy deserts, for which halohylon brushwood and shrubs serve as a place of their nesting. Sandy deserts are on the route for migratory birds from East Europe

and Northern Asia. for which sands are a place of short-term stay. Besides, more than 30 bird species from northern areas are attracted by mild winter to spend this period of year in the deserts.

### ***Stony (detritus, gypsum) desert***

This category is typical to basic landscape of Usturt plateau and a part of Kzylkoum desert. It also forms a separate area in the foothills in the south of the republic.

Climate of this type of desert is fairly similar to that of other types of deserts. Average annual temperatures are +10<sup>0</sup> C to +14<sup>0</sup> C with minimum temperature reaching -32<sup>0</sup> C and maximum up to +46<sup>0</sup> C. Precipitation rate is low - a maximum of 100 mm in the north and up to 200 mm in southern areas.

The characteristic features of soils in stony desert, which belong to the group of grey-brown soils, are their density, abundance of detritus and development of thick gypsum horizon, lying at a depth not exceeding 1 m.

The flora which occurs on grey-brown soils makes more than 400 plant species and includes species which occur on shallow soils of residual mountains and mixed rocks. The water and mineral nutrition of 41 plant species of plants is dependant on the soil gypsum horizons.

Vertebrate fauna of this type of desert totals about 130 species. Its profile includes 11 reptile species, about 100 bird species and 18 species of mammals.

Of birds, about 30 species nest there, among which the most characteristic are "avdotka", Pallas's sandgrouse, black-billed sandgrouse, Houbara bustard, homed house owl, dun goatsucker. golden bee-eater and 4 species of skylarks.

Rodents, including big "peschanka," Severtsev jerboa, small jerboa, and others, are the basic type of mammals in detritus deserts. This type of desert is a habitat for ungulates: saiga[k] and Goitred gazelle.

The most common reptiles are takyr and toad agamas, steppe agama, and fast lizard.

### ***Saline desert***

This type of desert is developed on saline plain plateau's (Usturt) and their slopes, on terraces of sand dunes (Aydar-Arnasay complex), in closed depressions (Ayakagitma, Karakata, Mingbulak, and others) and the contemporary Amu-Darya delta.

Characteristic features of saline land are constant humidity of superficial soil horizons and occurrence of temporary reservoirs. The peculiarities of the ecological environment of this kind results in specific fauna composition, with appearance of amphibians (green toad) and wetland birds.

The total number of animal species registered as inhabiting saline desert is about 130, of which 7 species are reptiles? about 100 are birds and 11 are mammals.

### ***Clay desert***

This is formed on clay and loess sediments in Kashkadarya basin and in Dalverzin and Golodnaya steppes. Most of the soils in clay desert belong to light sierozems.

Clay deserts are more endowed with superficial waters, plus, **due** to their [geographical] position, climate is relatively mild there. Average annual precipitation rate reaches 200 to 300 mm, and average annual temperature is +14 to +16°C. Minimum temperature is -28 to -30°C, the range of maximum temperature is +44 to +49°C.

Flora of clay desert is very similar to that of detritus desert (see above). However, the higher humidity results in denser vegetative cover in spring time

In terms of general fauna composition, clay deserts are similar to detritus ones. Central Asian tortoise, fast and multi-coloured lizards, and race-runner (grass-snake) can be named as characteristic representatives of animals. Of birds, double-spotted and steppe skylarks and on migration stops-grouses and cranes occur there.

The basic cause for disappearing of clay desert is the development of lands for agriculture. Almost all territory of Golodnaya steppe is completely transformed into cultivated landscape. Karshi steppe is being intensively developed, which could cause this natural component non-existent in near future.

### **3. Mountain steppes**

These occupy areas at heights up to 2000 - 2600 m above sea level. Dark sierozems are the main soils, though pale-grey and brown mountain-steppe soils are spread in upper parts. Average annual temperature is +11 to +14°C.

Flora composition of these habitats is represented by 634 plant species from 48 families and 257 genders. Three hundred and thirteen of the above species are endemic to Central Asia, 476 belong to flora common to Central and Fore Asia and the Mediterranean.

Three hundred eighty seven species (61%) belong to perennial grasses of early-summer or summer vegetation. Of these species, 107 are cryptophytes or geophytes and 37 are rhizome plants. Annual grasses make up 146 species, shrubs 34, and suffrutices 52.

Fauna composition of reptiles is represented by Turkistan agama, Asian "gologlaz" (Albepharus), scincus, "zheltopuzik," Tadzhik lizard, and Central Asian cobra. Other characteristic animals are: of birds-gall yellow-hammer, steppe kestrel, goat-sucker, golden bee-eater, "sizovorodka," skylarks; of mammals-steppe polecat, grey hamster, field-voles, badger, porcupine.

### **4. River and river-related ecosystems**

These are mainly linked to Amu-Darya and Syr-darya rivers and downstreams of Zerafshan and Surkhandarya. Composition of fauna is relatively limited but, nevertheless, some specific features are also intrinsic to it.

Inside all the variety of conditions of river ecosystems three basic habitat types can be distinguished: reed, open shoals, and tugai's per se.

### ***Tugai (gallery forests)***

So far significant areas have survived as narrow stripes or spots in the valley and the delta of Amu-Darya and, occasionally, in river valleys of Syr-darya, Surkhandarya, Zerafshan, and Chirchik. Their total area exceeds 1,660,000 hectares. Some fragments of tugai vegetation can be found downstream of Angren and Kashkadarya rivers.

Flora composition of tugai-type vegetation is depicted by 285 species of vascular plants belonging to 35 families and 105 genders. Forty plant species belong to specific vegetation of tugai

Abundance of moisture in tugai's makes it possible for amphibians to live there. Of resident reptiles, "gologlaz," "zheltopusik." and, in dryer places, lizards should be mentioned. Patterned and watery grass-snakes are very common here; "gourza" (*Vipera lehentina*) is not uncommon as well. Pheasant is the most significant bird. Black crow, magpie, and small representatives of passerines normally occur. Herons, glossy ibises, and cormorants form colonies, and kites, "tuviks," and others nest there. Mammals are represented by predators (reed cat, jackal, fox, badger), rodents ("tamarisk peschanka," lamella-tooth rat, Trans-caspian field vole), and ungulates (wild boar and Bukharan deer).

### ***Reed***

Reed is habitat or place of nesting for many birds including: "pogonysh," "water hen," "bald bird," "Turkestanian reed bird," whiskered titmouse, cuckoo, marsh harrier, black crow. Open sand/mud banks between reeds are nesting place for gulls, "krachkas," small plovers, steppe "tirkushka;" and are habitats of green toad, fast lizard, watery grass-snake, and desert "gologlaz."

### ***Rivers and shoals***

These are habitats for big and small shovel-noses, bastard sturgeon, Aralian barbel, "bald zhereh" [a kind of pike (*Aspiolucius esocinus*)]. Generally, the level of biodiversity of vertebrates is not high, but the role which rivers play in gallery and flood-land forests

conservation is essential.

Loess river cliffs form a specific kind of habitat and particularly provide sites for nests of "balobans" and lesser and vulgar kestrels. Among reptiles, desert monitor lizard hibernating in precipices should be specially mentioned.

Status: The above habitats are those the most damaged by human impact and have therefore a significant number of the Uzbekistan's endangered species. Bukhara deer (whose numbers are reduced to several hundred within Zapovedniks), and Central Asian otter, should be mentioned among those rare animals whose life strongly depends these habitats. The role of tugai's (gallery forests) in conservation of 6 subspecies of pheasant which are endemic in Central Asia, should be especially emphasised. Rare birds of river ecosystems are represented by wetland species: pelicans, white spoonbill, glossy ibis, and pygmy cormorant.

### **5. Internal marsh ecosystems (wetlands)**

The territory of Uzbekistan includes a rather unique combination of desert and wetlands. Wetlands can be subdivided into natural and artificial. The Amu-Darya delta belongs to those natural territories in the country which have undergone major changes. Marsh / wetland ecosystems are similar to river and river related ones but are characterised by greater expanses/quantities water and overall humidity.

### ***Amu-darya's delta***

The contemporary delta of the Amu-Darya lies downstream from Nukus city. It constitutes a slightly sloping plain with many canals. The delta as such is formed by numerous arms (Taldyk, Kazahdarya, etc.) Its area totals about 7000 km<sup>2</sup>. Starting from the mid sixties the surface flow of the Amu-Darya stopped reaching the Aral sea in dry years. As a result of decreased water flow into the delta and the retreat of the coastal line of the Aral sea, over 50 sweet-water lake have dried up, area of tugai forests has declined by 2 times and reed area by 6 times. However, by letting water into such lake systems as Kungrad, Sudoche, Mezhdureche, Karadzhar, Togouztour,

Daukempir, Kazahdarya, Dautkoul, Daukar, and Atpetk, a totaling 99,000 ha, have been gradually restored.

Soils are represented by meadow, marsh and saline types. The climate of Amu-Darya delta is distinctively continental. July temperature is +25 to 26 °C, February temperature is -10 to -13 °C. Annual precipitation rate is low, ranging from 110 to 150 mm.

There are two types of vegetation in the delta: tugai and reed, the latter prevailing. Meadow and meadow-alluvial soils are the substrate for hydrophytes: reed, cattail, rush, and sedge. At some places perennial reed forms floating thickets.

The lower parts of the Amu-Darya are historically an area where there is a concentration of many wetland birds during both nesting and seasonal migrations. There are large colonies of pink and curly pelicans, glossy ibis, big cormorant, and various kinds of herons. In addition, it is place of nesting for such birds as mute swan, grey goose, many kinds of river and pochard ducks, "bald bird," "volchock," "kamyshnitsa," "poganka," gulls, "krachka," and sandpipers.

Characteristic mammals are represented by musk-rat, wild boar, jackal, badger, fox, steppe cat, and crested "peschanka." Of reptiles, fast lizard and water grass-snake are considered background species. Grey gecko, desert "gologlaz," toad agama, and variegated grass-snake are as well characteristic.

Though substantial areas of the Amu-Darya wetlands were at least partially restored in the past their long term survival is severely endangered unless specific actions are taken. The biggest current threats are: lack of water, poor water quality (high salinity, low oxygen content) and pressure from local inhabitants.

#### ***Wetlands created by human activities***

Generally speaking, these ecosystems which have formed around mainly artificial reservoirs have become, for the last decades, the most important factor in conservation of fauna associations of wetland birds and waterfowl

and some compensation for decreased fish-stock in natural reservoirs.

The largest areas which should be mentioned, are the Aydar-Arnasay lake system, lakes Dengizkoul, Karakir, and Solenoye, and a number of artificial reservoirs: Toudakoul, Talimardzhan, Chimkourgan, and several others of double origin-discharge ponds (1) and river fresh-water storage's (2). The former are characterised by more stable hydrological regime and presence of coastal vegetation, while the intrinsic features of the latter are inconsistencies of hydrological factors (due to regime of their rivers-suppliers and the impact of water-management) and absence of coastal vegetation.

Vegetation growing on artificial wetlands is of tugai-reed type, i. e. the same type which is characteristic for natural areas.

## **6. Mountain ecosystems**

### ***Piedmont Semi-desert***

This represents a piedmont zone extending up to heights of 800-1200 m above sea level. Soils are represented by light sierozems with gypsum or detritus at places. Average annual temperature is +12.6 °C in Western Tien-Shan and +15 to +17 °C in spurs of Gissar ridge. Average annual precipitation rate is 250 to 400 mm. The width of the mountain semi-deserts belt is 30-50 km and makes up 2/3 (i. e. more than 64000 km<sup>3</sup>) of mountain territories of the Republic.

Vegetative cover of this belt is predominated by a formation of 14 wormwood species constituting the type of xerophilous suffrutex vegetation.

The semi-desert-type vegetation growing on sierozems is represented by 400 plant species, of which 150 do not spread beyond the limits of piedmont zone, while the range of 140 species extends further to higher mountains and about 100 species are the same as those found in the desert ecosystems

Suffiutices are represented by 44 ancient-Mediterranean species of which 28 are endemic

to Central Asia; 6 are found in Central Asia, Iran, and Afghanistan and habitats of the rest spread over various regions of the ancient Mediterranean. Perennial grasses make up 168 species, annual plants- 188 species.

Fauna of mountain semi-desert is represented by: reptiles — Central Asian tortoise, Turkestani gecko, takyr toad agama, “zheltopuzik” [paddles snake], desert monitor, multicoloured and fast lizards (black-eyed lizard in south), and multicoloured grass-snake; birds — skylark, gall yellow-hammer, “kamenka;” mammals — yellow gopher, red-tailed and big “peschankas,” jerboas, etc.

### ***Mountain deciduous forests***

These occupy small areas, totalling 2 18 200 hectares, located within the range of heights 800 - 1000 to 2500 - 2800 m above sea level. Relief of this belt is complex. The basic pattern consists of tree-shrub background alternated by steppe and meadow plots or bare rocks. The most common soil types are brown soils (on dry slopes) and fulvous soils of mountain forests (on the most humid slopes). Average annual temperature ranges from +8 to +10 or +12 °C, precipitation-from 400 to 600 mm.

The largest areas of deciduous species are concentrated in the Western Tien-Shan mountains: Ugam, Pskem, Chatkal, Tashkent, and Karzhantau ridges. They are located between heights of 800 and 2000 m above sea level.

Flora composition of forest associates consists of 47 tree species and 96 species of shrubs.

Mountain forests of Uzbekistan are differentiated by their species constituents, composition and growth conditions. They are subdivided into the two categories. (1) slope forests; (2) valley forests.

Relic forests are represented by: (a) walnut formations; (b) platan formations; (c) formations of vulgar persimmon.

Characteristic forest inhabitants include: several birds - white-winged woodpecker, magpie. Bukhara titmouse, turtle-dove, big

turtle-dove, “vyahir,” paradise and grey flycatchers, “slavka,” black crow, oriole? white-headed goldfinch, and “remez”; mammals—badger, wild boar, bear, dormouse, and Turkestani rat; reptiles - Himalayas agama, desert “goloklaz,” Central Asian “gourza” [*Vipera lebetina turanica*], and “shitomordnik” [a ‘shield-headed’ snake].

### ***Juniper (Archa) Forests***

“Archa”[ mountain juniper] forests are located at heights 1400 to 3000 m above sea level. Local soils belong to fulvous (dark-grey) mountain forest type.

Archa forests form the foundation of mountain forests in the Republic. Of total forest coverage of 105 000 hectares, they occupy 85 600. They are found: in the Western Tien-Shan on the slopes of Karzhantay, Ugam, Pskem, Koksu, Chatkal, and Kouramin ridges; and in the Pamir-Alay on slopes of Turkestan, Zerafshan, Gissar, and Baysoun ridges. There are insignificant areas in Kougitang and Babatang.

Archa forests of Uzbekistan mountains are formed by three juniper species: *Juniperus seravschanica* Komar., *J. semiglobosa* Rgl. and *J. turkestanica* Komar.

In Pamir-Alay mountain system, archa trees are widespread on northern slope of Turkestan ridge, forming, along with “tipchak” steppes, a clear vegetative belt at the heights 1900 - 2300 to 2800 (3000) m above sea level. In the upper part of this habitat (3200 -3500 m above sea level), Turkestan archa has a low, creeping shape not taller than 60 to 70 cm; it is succeeded by frost-resisting vegetation further up in mountains.

Archa forests are inhabited by a specific complex of vertebrates, among which there are several bird species deemed to be representatives of Chinese and Himalayan fauna. They include archa “budonose,” Himalayan “vyurok,” pink ‘lintil’, archa titmouse, white-throated nightingale, Himalayan “pishouha” and, not infrequently, magpie, big turtle-dove, and “slavka.” Archa field-vole is a typical mammal; forest mouse, hare, fox, wolf, stone marten, Tien-Shan brown

bear, and wild boar are observed as well. Reptiles found there include Alay “goloklaz,” Chemov agama, Himalayan and Turkestan agamas, and “shitomordnik” [the ‘shield-headed’ snake].

#### ***Sub-alpine and. alpine meadows***

**These** are located at the heights between 2800 m and 3600 to 3700 m above sea level. They are characterised by a significant rate of humidity (precipitation rate is up to 800 mm) and temperately cold climate with average annual temperature being +8<sup>o</sup>C. Their total area in the Republic is 0.6 mill hectares. Soils belong to the mountain-meadow-steppe fulvous type, and, less often, the chemoziem-like sub-alpine type.

Vegetation consists of formations of the following plants: *Polygoneta coriarii*, *Prangoseta pabulariae*, *Feruleta tenuisectae*, *Feruleta prangifoliae*, and *Feruleta jaeschkeanae*.

Of insects, characteristic animals are bumblebees. There is only one amphibious species i.e. the green toad. Alay “goloklaz” is a common representative of reptiles, a couple of their other representatives - Himalayan agama and “shitomordnik” can be sometimes observed. Characteristic birds include Himalayan “”, “bearded vulture, “kloushitsa,” alpine jackdaw, “zaviroushka,” homed lark, and “vyurok.” Bear, snow leopard, ermine, weasel; Siberian mountain goat, mountain urial, Menzbier’s and long-tailed marmots, field-voles, and red “pishouha” are characteristic mammals.

#### ***High Mountain Zone***

The zone of high mountains starts above 3500 m above sea level. Its total area makes 9,600,000 sq. km. All the year round average 24-hour temperature never exceeds 0<sup>o</sup>C.

Vegetation is represented by ‘carpet’ meadows of undersized grass that are characteristic to alpine belt of glacial-relief high mountains. This relief consists of high-mountain peaks, glacial cirques, moraine, and steep rocky slopes.

Flora of short-grass carpet meadows of Uzbekistan totals 110 typical alpine species of which 40 species are endemic to Central Asia. The following species act as formations edificators and sub-edificators: *Lagotis korolkovii*, *Geranium regelii*, *Ranunculus rubrocalyx*, *R. rufosepalus*, *Ferula alaiica*, *Oxytropis microsphaera*, *Puccinellia subspicata*, *Astragalus subrosularis*, *A. aphanassjevii*.

There are no permanent vertebrate inhabitant in this zone. Of seasonal visitors: the following animals are observed: Siberian mountain goat, snow leopard, and large birds of prey.

#### **7. Species Richness, Endemism and Rarity**

Biodiversity of Uzbekistan includes more 27,000 species (Table J) Among these, animals are represented by over 15,000 species, while plants, fungi, and algae total about 11,000 species.

Table J: Species Richness of Major Types of Biodiversity

Types	Species Numbers	%
Bacteria	1942	7.19
Viruses	200	0.7
Protozoa	870	3.2
Planar helminths	300	1.1
Round helminths	930	3.4
Molluscs	140	0.5
Arthropods	11300	41.8
Vertebrates	664	2.5
Fungi	2008	7.4
Higher plants	4500	16.6
Algae	4146	15.3

Table K: Species Diversity of Main Taxonomic Groups of Arthropods

Classes / Orders	Total Number of Species	Percent of the Total Number of Arthropods
Arachnids	800	7.0
Insects:		
<i>Orthoptera</i>	400	3.5
<i>Homoptera</i>	900	7.9
<i>Hemiptera</i>	700	6.2
<i>Coleoptera</i>	3000	26.5
<i>Lepidoptera</i>	1500	13.3
<i>Hymenoptera</i>	1500	13.3
<i>Diptera</i>	1200	10.6

Of invertebrates, arthropods constitute the largest group. The majority of species belongs to insects among which 7 large orders are outstanding for species diversity ranging 400 to 3000 (Table K).

The territory of Uzbekistan is a valuable habitat for endemic animal species of Central-Asian origin. Several species originated and evolved in the area between Amu-Darya and Syr-darya rivers, and expanded to other Central-Asian regions.

Table M: Comparative Estimates of Species Diversity of Vertebrates

Classes	Number of Species		
	in the world	in CIS	in Uzbekistan
Fishes	22000	500	83
Amphibians	2300	34	3
Reptiles	6750	147	59
Birds	9672	764	424
Mammals	4327	332	97

Table L: Endemism Rate among Terrestrial Vertebrates in Uzbekistan

Classes	Total Number of Species	Number of Endemics	Percent of Endemics
Reptiles	58	30	51.7
Birds	424	8	1.9
Mammals	97	15	15.4
Sum total	579	53	9.2

Vertebrates are represented by 5 classes comprising 664 species (Table M).

So far, vertebrates known to be endemic to Uzbekistan/Central Asia include 53 species and subspecies (Table L). Endemism rate among fishes is as high as 52%.



Flora of Uzbekistan is represented by at least 48,000 species of vascular plants, belonging to 650 genera and 115 families. Endemism rate is rather low and equals 8% (or 400 species) of the total number of species. Relic endemic species count 10 to 12% of all endemics.

## 8. Threats to biodiversity

The main threat to biodiversity in Uzbekistan is habitat loss and major habitat alteration. The

following three groups of human-activities factors have the strongest impact on natural ecosystems in Uzbekistan:

1. Developing new lands for agriculture, accompanied by redistribution of irrigation water resources.
2. Use of natural territories for pastures.
3. Mining and energy industries.

Table N: Distribution of Vertebrates by Ecosystem

	Number of Species by Ecosystem			
	Desert	Rivers (riverine)	Close reservoirs	Mountain forestry
<b>MAMMALS</b>				
Total	57	22	10	57
Rare	12	2	-	14
%	21.0	9.0	-	24.5
Endemics	9	1	-	5
%	15.7	4.5	-	8.7
<b>BIRDS</b>				
Total	>28.0	>20.0	>17.0	>21.0
Rare	22	21	22	24
%	7.8	10.5	12.9	11.4
Endemics	1	5	3	1
%	0.3	2.5	1.7	0.4
<b>REPTILES AND AMPHIBIANS</b>				
Total	33	12	6	27
Rare	8	1	-	1
%	24.2	8.3	-	3.7
Endemics	23 + subspecies	-	-	7 + subspecies
%	69.9	-	-	25.9
<b>FISHES</b>				
Total		56	56	15
Rare		8	8	1
%		14.3	14.3	6.6
Endemics		33	30	4
%		59.0	53.5	26.6

Note: 'birds' refers to both nesting and migratory birds

Table O: Biodiversity of Main Natural Territorial Complexes

NATURAL TERRITORIAL COMPLEXES		Area (km <sup>3</sup> )	%	Number of Species
<b>Desert</b>	Sandy desert	9870	22	320
	Clayey desert. clay-pan desert	13185	29	400
	Detritus desert and residual heights	1700	4	566
	Saline-land desert	1310	3	304
<b>W e t l a n d s</b>	River flood-lands and lakes	1541.3	3	285
<b>Desert steppe and grassland steppe</b>	Piedmont semi-deserts	459	1	1180
	Dry mountain steppe	365	1	634
<b>Forested and grassland mountain</b>	Deciduous mountain forests and shrubs	218.2	0.4	248
	Juniper ('Archa') forests	85.6	0.2	235

Generally, these groups cause the following impacts: intensified desertification; increased load on pastures and overgrazing; irrigation and ploughing up followed by soil salinisation and lands becoming unusable; river flow control; constructing of hydroelectric power stations; agricultural activities and disturbing of hydro-balance in upper water-catchment areas; cutting down riverine and gallery forests; dragging river bottoms for sand and gravel; unstable water regime with drastic fluctuations of water-table level and salinisation; pollution with pesticides, polydichloropeniles, and heavy metals; logging forests; collecting wild plants; illegal hunting; damaging recreation.

Excessive development of the irrigated agricultural sector has resulted in expansion of irrigated lands in the region from about 25,850 km<sup>2</sup> in 1955 to 42,218 km<sup>2</sup> by 1990 and increase in water use, which has reduced flow into the Aral Sea from about 68 km<sup>3</sup> in 1960 to about 6 km<sup>3</sup> in 1989.

Though in terms of total land area irrigated lands comprise about 10%, their impacts on the ecology of Uzbekistan and the neighbouring Republic's has been enormous with the total destruction of some ecosystems, severe reduction of others and significant alteration of almost all. Threats vary between those which cause direct destruction of habitats (i.e. land clearance) and those with indirect and less quantifiable impact (e.g. climate change and

changes in hydrological cycles).

The development of irrigated agriculture has had little direct impact on desert /semi-desert and mountain ecosystems which make up the majority of the country. However, it has had significant indirect effect particularly on desert ecosystems which are highly sensitive to change. The exposure of the Aral seabed and decreased vegetative cover have caused significant local climate change with increased aridity and temperature extremes, higher wind speeds and rapid onset of desertification processes. Wind blown pollutants are also having an effect.

Compared to the arable agriculture, changes in the development of the livestock sector are possible much faster because there is a less dependence on a centralised system and water infrastructure. Thus, individuals are rapidly increasing livestock numbers to meet short term economic objectives at the expense of damage to sensitive arid ecosystems. This is a major threat to desert, steppe and, to a lesser extent, mountain ecosystems unless carefully regulated.

Though industrial and municipal threats are, in comparative terms, of less significance than those connected with agriculture, the development of industry and municipal use of resources has had a significant impact, mainly through additional pollution of water thus

contributing to the threat on aquatic / semi-aquatic systems. In addition, the mining / metalwork industries has had a significant impact in parts of the country, particularly on desert ecosystems.

Despite the fact 'that the value of biological resources and the priority for maintaining ecological stability has increased, essentially the threats indicated above still exist today and, thus, must be guarded against for the foreseeable future.

***Ecosystems and species under severe threat:***

The most impacted ecosystems belong to: *lowland territories; flood-lands and riverine areas being developed for irrigated agriculture.. wetlands; the Aral Sea rezgon.*

So far, some level of damage has been inflicted on 80% of clay desert territory> 95% of riverine

*Table P: Numbers of Rare and Extinction-Endangered Species of Uzbekistan*

Classes	Numbers and percent of total		
	Rare and endangered species of Uzbekistan (1996)	CITES	The Red Book of IUCN of 1996
Mammals	27 (27.8%)	11 (11.3%)	23 (23.7%)
Birds	62 (14.6%)	59 (13.9%)	23 (5.4%)
Reptiles	14 (23.7%)	4 (6.7%)	4 (6.7%)
Fishes	10 (12.0%)	4 (4.8%)	4 (4.8%)
Non-vertebrates	48	1	36

areas, 20% of sandy desert (90% in the Fergana Valley), and 40% of mountain areas.

River flood plains and riverine areas have suffered large scale clearance of natural vegetation cover and conversion to irrigated fields. Further loss or degradation has been caused by high levels of salinisation, water-logging, and agro-chemical pollution, caused by poor agricultural practices.

Aquatic and semi-aquatic systems are highly sensitive to increased salinisation of water and pollution with agro-chemicals. In addition, widespread changes in natural hydrological cycles resulting from development and management of water control infrastructure for irrigation has significantly altered aquatic environmental conditions resulting in species

and habitat decline or loss. The introduction of numerous exotic fish species has likewise altered ecological balances.

The Aral Sea basin, which is the hydrological sink for almost the entire Central Asia region, is the area which has suffered the worst impacts from the development of irrigated agriculture. The expanded and inefficient use of irrigation water resulted in a rapid decline of inflow to the sea causing its level to drop drastically. The major direct impact has been the threefold increase of salinity and a resulting extinction of most life-forms.

The impacts on the biodiversity of terrestrial fauna and flora varies substantially from one ecosystem to another depending also on the degree of transformation undergone by a given natural zone.

Extinction of a number of vertebrates, because of their habitat degradation or as a result of

actual extermination, is vividly exemplified by big mammals. The habitats of several representatives of ungulates and predators were affected from the beginning. Among predators, Turanian tiger and cheetah have become extinct, and striped hyena, 'lynx' (lynx), and Fore Asian leopard are approaching this state. Different categories of rare and extinction-endangered animals include 161 species; many of them being listed in the CITES registry and the IUCN Red Book of 1996 (Table P).

The total number of plant species included into the first edition of the Red Book of Uzbekistan is 163; the draft version of the second edition so far includes as many as 301 species

**9. Agro-biodiversity**

This refers to the genetic variability in

cultivated plants and domestic animals, together with their progenitors and closely related wild species growing and evolving under natural conditions.

Global agriculture is dependant on an extremely narrow range of the total biodiversity in the world. In addition of those plants / animals that have been selected and utilised by humans for agriculture, genetic variability has been narrowed by historical breeding techniques which has concentrated on selection of types best meeting immediate needs/conditions and the discarding of others. This has resulted in the loss within localised agricultural species of the genetic material providing the potential for wide adaptability to environmental conditions (disease and pests, drought, salinity, water logging, severe temperature regimes etc ).

Work initiated by N.I. Vavilov in the 1920' to map centers of origin of cultivated plants identified that Central Asia, including Uzbekistan is an important Center for agro-biodiversity. The regions importance includes both wild progenitor species and high genetic crop diversity. Unfortunately, past policies and approaches have underestimated the value of traditional crops and livestock with the result that there has been extensive replacement with introduced exotic breeds and decline / endangerment of traditional races. In addition, the concept of agro-biodiversity is not as yet well developed in the Republic and no clear information concerning the status of agro-biodiversity, or research and development in this field were available for this report. However, the Republic significant capacity in the fields of biological and agricultural sciences and this is a field of work that could be rapidly developed. In addition as a primarily agricultural economy, this is a field of particular importance not just globally but for the republic as well.

## **10. Current Services and Benefits of Biodiversity in Uzbekistan**

### ***River Catchment and River basin Protection:***

**Upper Catchments:** It is not an exaggeration

to say that Uzbekistan's survival is closely linked with the availability and reliability of the limited water resources originating from the mountainous areas to the east of the country. The ecological stability of the catchment areas for the tributaries which form the **Amu Darya** and **Syr-darya** Darya rivers are therefore of paramount strategic and economic importance to the Republic. The maintenance of viable ecosystems in these areas and the protection of biodiversity is thus vital. It is therefore critical that Uzbekistan ensures that adequate protection of biodiversity is given to upper catchment areas within its borders and that it is supportive of activities in other Republics which contribute to this objective

Some concrete ways in which protection of natural vegetation contributes to maintaining quantity / quality of upper catchment areas run-off include: conservation and regulation of precipitation run-off (and thereby maintenance of total quantity /flood characteristics), micro and meso-climatic amelioration (stabilise precipitation and evapo-transpiration), reduction in erosion and sediment loads (maintain quality of water and reduce downstream sedimentation problems).

**Lower catchments and river basins:** Lower catchment and river basin areas in Uzbekistan are characterised by high levels of irrigation agricultural use and exploitation of water resources by municipal and industrial users. The existence of viable ecosystems in these areas is again vital for some of the following reasons: Firstly, viable aquatic and riverine ecosystems provide a cleansing mechanism for pollutants entering the system, particularly organic material - this contributes to the quality of water received by downstream users; secondly, vegetation within irrigated lands helps to stabilise groundwater levels thus preventing water logging and salinisation processes occurring; thirdly, vegetation ameliorates the micro-climate in agricultural areas thereby improving the conditions for agricultural production and the health/quality of life of local populations.

### ***Soil Erosion Control:***

The existence of natural vegetation prevents /

Table Q: Wood and Timber Procurement by the State Committee for Forestry from 1993 to 1996

Year	Total (m <sup>3</sup> )	Timber	Fire-wood	Brush-wood	Value of forestry products	Value of Timber	Currency
1993	73.938.7	2.540.4	29.433.8	38.914.6	110.021.7	18.117.5	roubles
1994	60.226.3	3.276.4	26.831.3	30.123.6	2.064	780.2	sum-coupons
1995	52.741.9	3.596.8	22.333.1	26.802.2	6.430.5	2.741.2	000 sums
1996	49.680						

reduces all forms of erosion. In the mountain areas of Uzbekistan it is particularly important in the prevention of mud-slides that can do enormous damage. In lowland areas vegetation is important in reducing ground wind speeds and thus in the prevention of wind erosion from agricultural fields and other areas.

### ***Desertification:***

Loss of natural forestry and vegetation, the desiccation of the Aral Sea resulting in the creation of a large area of saline desert. overgrazing of pasture lands, alterations in the hydrological system, etc. have set in motion extensive desertification processes in all the Central Asian Republics but most significantly in Uzbekistan. Kazakhstan and Turkmenistan. Remaining areas of both natural and artificial vegetation are play a crucial role in reducing the rate of desertification. In the future, to combat this problem, it is necessary to ensure that currently viable areas of vegetation in vulnerable areas are maintained and that efforts to stabilise areas already degraded are undertaken with the long term aim of their restoration.

### ***Economic Biodiversity Uses:***

As previously indicated the economic development of the country is ultimately dependant on the health and stability of its basic natural resources (i.e. climate. water resources, biological resources, agricultural resources, etc. all of which are interlinked). The

most important mechanism for ensuring the long term maintenance and stability of these basic resources is via the conservation of a sufficient level of biodiversity so as to ensure critical ecosystems functioning.

In addition to the generalised importance of biodiversity conservation to the economy of the Republic there are a number of direct economic (monetary and non-monetary) benefits that are / can be accrued. These are as follows:

- Production of timber. fuel wood and non-timber forest products (medicines, nuts, natural textile dies, etc.)
- Hunting, game ranching/farming (i.e. production of meat and other products from wild animals) and furs.
- Fisheries (both commercial and sport)
- Recreation and tourism.

**Forestry:** There are a variety of forest products with significant economic value in Uzbekistan, including timber, fire-wood, brush-wood, liquid products, medicinal plants, nuts and others.. The table below (Table Q) provides information on the values of some of these forest products.

The table below (Table R) shows medicinal and spice plants of economic value in Uzbekistan and the quotas / collections made of them in 1996. Unfortunately, no estimate of monetary value is available.

Table R: Medicine and Spice Plants Collected in Uzbekistan in 1996 and the Quotas Allocated for 1997 (tones)

Collected plant	Quota for 1996	Actually taken	Quota for 1997
dogrose	129	54.6	60
St. John's wort	18	12.9	13
Dushitsa (Душица)	20	13.7	14
Garmala (Гармала)	20	18	20
Zhira (Зира)	1	0.3	0.3
rhubarb	70	60.5	70
barberry	7	3.5	4
Zhizifora (Зизифора)	16	11	8
Devuyasia (Девясил)	2	1	2
shepherd's purse	4	1.2	2
nettle	3	2.1	3
Kadonopis (Кодонопис)	2.5	2.3	3
plantain	1	0.05	1
bitter wormwood	3	1.8	2
horse-tail	0.5	0.2	0.3
coltsfoot	0.3	0.08	0.2
sage	0.5	0.5	0.5
Vodyanon Perets (Водяной перец)	1.3	0.5	0.5
bur-marigold	0.5	0.1	0.2
fine-crossed wormwood	34	-	-
Safora yaronskaya (Софора японская)	2	0.2	0.2
T'syachelistnik (Тысячелистник)	1	1	1
liquorice	43	3	5
Mediaziya (Медиазия)	0.85	0.6	0.8
Total	388.6	189.1	215.5

**Hunting:** Hunting in Uzbekistan is carried out for 4 basic purposes: recreation, food, fur/skins, and scientific purposes. Hunting is controlled and fixed by law (Table S). There are over 50 hunting / fishing reserves in the Republic where animal stocks are managed (fed and protected). The majority of them are located in wetland areas where the most important sport-hunting species are waterfowl.

During the last five years there has been a significant decline in recreational hunting due to the high costs of equipment and ammunition

and other economic factors. In addition, muskrat trapping for fur, which used to be an important economic activity in the Aral Sea / Amu Darya Delta area, has almost ceased due to drastic declines in muskrat populations resulting from habitat loss.

**Fisheries:** In terms of actual catch and value of catch there is available data for commercial fishing for the year of 1995 (

Table T below). There is also data related to quotas for 1996 and potential income. No information on income from sport fishing is available.

Table S: Hunting Quotas for Wild Animals

Kind of animals	Quota of 1996	Actually killed in 1996	Cost Licence / item (sum)	Income 1996
Bear	-	-	-	-
wild boar	100	100	1,200	120,000
mountain goat	50	20	1,200	24,000
wild goat	10	5	600	3,000
saiga(k) [?]	10	-	-	-
badger	500	20	30	600
porcupine	500	40	30	1,200
hare	5,000	2,000	12	24,000
marten	300	20	300	6,000
fox	2,000	1,000	180	180,000
red marmot	-	-	-	-
waterfowl	100,000	45,000	12	540,000
'keklik' [?]	5,000	2,000	1.8	3,600
pheasant	500	400	30	12,000
pigeon group	200,000	100,000	3	300,000
'gourza' ( <i>Vipera lebetina</i> )	1,000	150	600	90,000
'cfa' ( <i>Echis</i> )	150	100	600	6,000
tortoise	10,000	10,000	12	120,000
poisonous nonvertebrates	300,000		6	
Total				1,430,400

**Recreation and Tourism:** Tourism in Uzbekistan has developed almost entirely on the basis of historical / cultural features of the country (cities of Samarkand, Bukhara, Khiva, etc.) with little policy emphasis on natural attractions in the country or eco-tourism. However Uzbekistan has spectacular natural scenery, including deserts, wetlands and extensive mountains. It thus has a very good basic resources for developing eco-tourism. Such development would greatly increase the potential of the country as a tourist destination and maybe critical in bring about the injection of additional resources and economic activity to the new protected areas being developed and communities around / within them.

recreational and tourist activities i.e. Ugam-Chatkal National Park near Tashkent and Zaamin (Djizak) Peoples Park near Djizak and Samarkand.

Ugam-Chatkal NP reportedly received between 5,000 and 6,000 registered visitors in 1996 and a similar number of unregistered. No information regarding the economic returns from these visitors is available.

Zaamin NP is visited on average by about 1,500 organised tourists and 3,000 unregistered each year. No data concerning economic returns or number of intematronal visitors is available.

Appropriate tourism development (eco-tourism and activity holidays) for protected areas and other

Table T: Commercial Fisheries - Quotas, Catch and Estimated Value (GOSBIOCONTROL)

Quota 1995 tons	Catch 1995 tons	Estimated Value 1995 (sums) *	Quota 1996 tons	Potential value (if quota fully used) - sums *
5689.7	3584.2	4,301,040	4,000	4,800,000

\* based on an average license fee of 1,200 sum /ton

Tourism in Protected Areas. Currently there are two protected areas within Uzbekistan open to

natural areas of landscape value will be important factors in their future survival. However it will require a very specific approach which emphasises

minimal negative impacts on the biodiversity of areas and maximum direct benefits for protected areas managers and local people. In Uzbekistan little experience of such “eco-tourism” exists, and certainly is lacking within Uzbektourism.

Development of tourism activities within protected areas must be integrated into their overall management and should therefore remain primarily

in the hands of protected areas managers. However partnership with international companies with wide experience in this field will be extremely beneficial in developing both international marketing and actual operation of such activities. Partnership with local ventures and communities will also be important in ensuring sustainability and direct benefits.



# **EXISTING PROVISIONS FOR BIODIVERSITY CONSERVATION AND SUSTAINABLE USE**

## **1. Historical Development**

The first formal efforts to control and protect biological resources in Uzbekistan can be dated back to the end of 19th century following the domination of the region by Czarist Russia, when in 1897 the forest protective law “A Statute about the saving of forestry “ was issued. This was followed after Soviet take over with the issuance in 1918 of the Law “ About nationalisation of land and forestry of Turkestan” in which the State wood fund was defined.

Since 1924 problems of nature saving have been given more careful attention. At that time financing of operations on artificial cultivation of woods, organisation of economic usage of woods, protection of reserved places was started. The protected areas concept has a long history in Russia and in the early part of this century Russia/Soviet Union developed perhaps the most extensive and effective protected areas system in the world. In Uzbekistan this was demonstrated by the creation in 1926 of the Guralash reserve and Chatkal State Reserve in 1946 The key past events in the development of nature protection in Uzbekistan are listed below

- 1940's - State committee on forestry facilities in the structure of state wood inspection was organised.
- A State Hunting Inspection in the system of Council of Ministers was organised.
- 1946 - Organisation of Chatkal reserve
- 1962 - Department on protection of fish stores was organised at Ministerial Council
- 1963 - Uzbek basin department of

protection of fish stores

Uzbekrybvod was organised

1982 - Headquarters of hunting facilities and reserves is organised

1988 - State Committee for Protection of a Nature responsible for State inspection on protection of flora, fauna and reserves is organised

## **2. Legislative Framework**

The Forestry Code was adopted on June 26, 1978. It regulates use and restoration of forestry resources and responsibility of juridical and nature protection persons when using forestry resources.

The law “On protection and use of wildlife” was adopted in 1982. It states legal relations aimed at protection, sustainable use, and reproduction of wildlife.

The law “On land “ was adopted on June 20, 1990, with changes and additions, made by the Supreme Council of the Republic of Uzbekistan on Nov. 20. 1991. on May 6 1993, and on September 23, 1994.. It is directed at the regulation of the land-related arrangements with the purposes of providing for rational use and protection of land, maintaining fertility of soils, saving and improving of the natural environment, for equivalent development of all forms of management.

The law of the Republic the Uzbekistan “On protection of nature “ which was adopted on December 9, 1992: The law installs legal, economic and organisational principles of saving the natural environment, rational use of natural resources, protection of ecological

systems, natural complexes and separate objects. It guarantees the rights of the citizens to live in favourable environment. It determines powers of official bodies and departments in the field of nature protection.

The law "On specially protected natural territories" was adopted on May 7 1993. It determines legal, organisational and economic principles of handling of especially protected natural territories.

The law of Republic the Uzbekistan "On water and water use" was authorised on May 6, 1993. It regulates the water related aspects, rational use of waters for needs of the population and national economy. The law regulates protection of water from contamination and exhausting, prevention and liquidation of harmful effect of water, improving of water objects, and also protection of the rights of firms and establishments, organisations, private farms and citizens in the field of the water management

The Law "On undersurface resources", directed at the regulation of the management, protection and use of resources was adopted on September 22, 1994.

The Law "On protection of atmospheric air" was adopted on December 1996.

In addition to the above, regulation in the field of protection of valuable and disappearing species of plants and animals in the republic, is carried out based on the Resolutions of the Supreme Council of the Republic of Uzbekistan of September 3, 1993, No. 937-XII "On greater protection of valuable and vanishing plants and animals and regulating their use"; Resolution of Cabinet of Ministers of the republic a Uzbekistan of December 15, 1993, No. 600 "About measures on strengthening of protection of the wild animals and plants and regulation of their use" and Instruction of the Cabinet of the Ministers of the Republic of Uzbekistan of February 11 1996, No. 76-F about regulation of import/export of predatory birds in the Republic of Uzbekistan.

The order of hunting and fishery in Uzbekistan is carried out according to the above mentioned laws, and also with the Ordinance On hunting and support of a hunting and fishing facilities on the territory of the Republic, authorised by Resolution of the Cabinet of Ministers on April 1, 1991, No. 95, and also Rules of hunting and fishery on territory of the Republic, authorised by orders of State Nature Protection Committee of June 8, 1992 and January 5, 1993.

Some aspects of legal regulation of nature use and the protection of the natural environment are placed in the laws "On the property in the Republic of Uzbekistan", "On enterprises in the Republic of Uzbekistan", and "On rent".

The Decrees of the President of the Republic of Uzbekistan of January 21, 1994 "On measures on further deepening of economic reforms, support to private property and development of business" and of November 24, 1994 "On increasing the efficiency of land use" also contain norms relating to the legal mode of land.

The relations of use and protection of certain natural resources are regulated by the resolutions of Government of the Republic of Uzbekistan. They include the resolutions of the Cabinet Ministers of August 3, 1993, No. 385 "On limited water use", of July 27, 1995, No. 293 "On introduction of rates for calculation of damage caused to the vegetative world of the Republic of Uzbekistan", of May 27, 1992, No. 248 "On introduction of an order of registration of materials on withdrawal and allocation of land for non-agricultural needs in the Republic of Uzbekistan", of April 7, 1992, No. 174 "On endorsement of a procedure for water protective zones of reservoirs and other water bodies, rivers, trunk channels and collectors, as well as sources of potable and domestic water supply, medical and rehabilitation facilities in the Republic of Uzbekistan.

For violation of the nature protection legislation the following responsibility is foreseen: administrative, criminal, civil-law (material), disciplinary, and economic penalties. On September 22, 1994 the Code "On the

administrative responsibility” and Criminal Code were adopted, where there are envisaged accordingly administrative and criminal liability for ecological offences.

New laws for protection and sustainable use of wildlife and flora-are being currently developed.

International Legislation: The problem of nature protection are one of the most prioritised in the world. The nature protective activity is regulated by the international conventions and agreements. By now the Republic of Uzbekistan has joined, in addition to the International Biodiversity Convention, the UN Frame Convention on climatic changes (May 1993 ), the Vienna convention on protection of the ozone layer. and Montreal protocol on substances destroying ozone layer (May, 1993.), to the Basle convention on a control of trans-border transportation of dangerous waste and their disposal (December, 1995.). Uzbekistan has ratified the UN convention on Combating Desertification in those countries, which face serious drought and / or desertification (August, 1995 ).

The republic exhibits large interest in the international conventions, directed on saving of biological resources. Since October 1995 Uzbekistan has been a member of the convention on biological diversity. Within the framework of the Bonn convention the following were signed: the convention on protection of thin-beaked curlew, Memorandum of Understanding on saving of Siberian crane, convention on Afro-Eurasian migrating water birds. Uzbekistan is currently considering association to the convention on trade in fauna and flora species under threat of disappearance (CITES) and Ramsar convention on protection of wetlands.

### **3. Institutional Context of Biodiversity Conservation**

#### ***The State Committee For Nature Protection:***

The State Committee for Nature Protection ‘Goskompriroda’ is the main specially authorised overall co-ordinating organ for

nature protection. Its basic tasks are as follows:

Implementing governmental control over protection of natural environment, use of and restoration of natural resources;

Implementing inter-sectorial system management of nature-protective activities;

Developing and implementing unified nature-protective and resource-saving policies;

Taking other actions toward a ecologically sustainable and healthy environment;

Managing protected areas. and ensuring integrity of their protection regime;

The State Committee for Nature Protection includes the following departments:

1. Atmosphere Conservation;
2. Supervision of Land And Water Resources Conservation and Use;
3. Scientific/Technical Innovations and Their Propaganda;
4. Economics and Organisation of Natural Management;
5. State Expertise Committee;
6. Environmental Information and Forecast;
7. Foreign Relations and International Programs;
8. Environmental Law;
9. Conservation and Use of Under-Surface Resources and Waste Utilisation;
10. Environmental Standards, Standardisation, and Certification;
11. Accounting, Reporting, and Economics.

Besides this , there are two specialised National inspections within Goskompriroda:

- State Biological Control Service responsible for conservation of flora and fauna and reserves management (Gosbiocontrol);
- State Inspection of Specialised Analytical Control (GOSSIAC).

A certain role in protection of flora and fauna is played by other ministries and departments, the most important of which are the State Committee for Forestry (Goskomles) and the concern "Uzfish" (Uzryba) which in the government structure have departmental inspections on protection of biological resources.

***State Committee for Forestry (Goskomles):***

The primary responsibilities of the State Committee for Forestry are:

State management in the field of use, reproduction, protection of woods, support of reservations and national parks on territory of forests;

Departmental management and supervision of the hunting facilities, enforcement of rules of hunting on territory of forests;

Realisation of a unified policy, directed at the extension and rational use of wood resources, on their reproduction and improving of the situation with forests with the purposes of increasing their ecological and land-reclamation value, the fullest meeting of needs of national economy and population in forests' products;

Registration and assessment of wood fund, flora and fauna;

Running of reserves, state hunting facilities, provision of departmental protection for flora and fauna, control for observance of rules, norms, timing of hunting- control of the hunting facilities and other requirements on protection and use of fauna, regularity

and timeliness of development and realisation of measures on saving the environment, conditions of reproduction and paths of migration of animals, running state cadastre of wild animals on territory forests; realisation of measures on collection and production of medicinal and food plants;

Observance of forest-related legislation, control in the performance of the normative and engineering specifications of forest management and hunting facilities.

The State Committee for Forestry is allowed to set up serpentaria nurseries for poisonous snakes and other valuable animals (including fish), nurseries and shops for processing of skin-fur products, and also products of hunting and fishery and their sale, and to set up joint ventures for foreign hunting tourism activities.

There are the following departments, regulating the use of wood and biological resources, within the structure of the State Committee for Forestry:

- 1 Administrative Board for Forestry Management, Conservation, and Protection
- 1 State Forestry Inspection
- 1 Main Administrative Board for Hunting Facilities, Reserves and National Parks (Glavokhota).

Protection of forestry resources is carried out by the State Forestry Inspection, with a staff of over 1000 inspectors (as of the end of 1996), including those from the Committee's headquarters, regional departments, forest nurseries, and state reserves.

***Corporation Uzfish (Uzryba):***

This organisation is responsible for management and agency-level protection of fishery resources in areas of natural and artificial reservoirs and streams.

***Union of Hunters and Fishermen of***

### ***Uzbekistan***

This is a national-level NGO using, on a long-term basis, game and fishery lands, conserved by an agency-based gamekeeping service.

#### **4. Existing Protected Areas System**

It is agreed that the biological diversity is saved most effectively *insitu*, especially within.

Table U: Summary Data of Protected Areas

Yo.	Official name and year of foundation	Location	Area km <sup>2</sup>	IUCN Category	Agency
State	Strict Reserves (Zapovedniks)				
1	Chatkal mountain forestry biosphere reserve 1947	Tashkent province, Parkent and Akhangaran districts	356.8	I	Goskompriroda
2	Gissar mountain archa reserve 1983	Kashkadarya province, Yakkabag and Shakrisabz districts	814.3	I	Goskompriroda
3	Zaamin mountain archa reserve 1926, 1960	Dj izak province. Zaamm and Bakhmal districts	268.4	I	Goskomles
4	Badai-Tugai steppe-tugai 1971	Republic of Karakalpakstan, Beruni and Kegeli districts	64.6	I	Goskomles
5	Kyzylkum tugai-sand reserve 1971	Bukhara province, Romitan district: Khorezm province, Druzbinski district	101.4	I	Goskomles
5	Zerafshan lowland tugai reserve 1975	Samarkand province, Bulungur and Jambay districts	23.5	I	Goskomles
7	Nuratin mountain wallnut-tree reserve 1975	Jizak province, Farish district	177.5	I	Goskomles
8	Kitab geological reserve 1979	Kashkadarya province, Kitab district	53.7	I	Goskomgeologia
9	Surkhan mountain forestry reserve, 1987	Surkhandarya region, Sherabad and Termez districts	276.7	I	Goskomles
	Total area:		2136.9		
State	National Parks				
1	Zaamm People's Park 1976	Djizak region, Zaamin district	241.1	II	Goskomles
2	Ugam-Chatkal Natural National Park 1990	Tashkent region, Bostanlyk, Parkent and Akhangaran distr	5745.9	II	Goskomles
	Total area:		5987.0		
	Nurseries for Rare Animals				
1	Ecocenter "Jeyran" 1976	Bukhara region	51.4	III	Goskompriroda
	Total area:		51.4		
	State Reserves for Special Purposes or with Relaxed Protection Regime (Zakazniks)				
1	Arnasay 1983	Dj izak region	1633.0	IV	Uzryba
2	Karakul 1990	Bukhara region	100.0	IV	Goskompriroda
3	Saygachy 1991	Republic of Karakalpakstan	10,000.0	IV	Goskompriroda
4	Sydochy 1991	Republic of Karakalpakstan	500.0	IV	Goskompriroda
5	Sarmysh 1991	Navoi region	25.2	IV	Goskompriroda
6	Karakir 1992	Bukhara region	300.0	IV	Goskompriroda
7	Kamabchul 1992	Samarkand region	400.0	IV	Goskompriroda
8	Koshrabad 1992	Samarkand region	165.0	IV	Goskompriroda
9	Dengizkul 1992	Bukhara region	186.0	IV	Goskompriroda
	Total area:		112239.2		
State	Natural Memorials				
1	Vardanzi (1975), 1983	Bukhara region	3.0	IV	Goskomles
2	Yazyavan 1991	Fergana and Namangan regions	31.8	IV	Goskompriroda
	Total area:				

protected natural territories - reserves, natural national parks, strict reserves and other protected territories. Of some value are also nurseries or centers of cultivation / breeding of rare species of animals

**Categories of Protected Areas:** In Uzbekistan there are currently four basic categories of protected areas; State Reserves (Zapovedniks), State National Parks, Special State Reserves (Zakazniks), and State Natural Memorials.

Currently, the protected areas system consists of nine State Reserves (Zapovedniks) with area of 2 164 km<sup>2</sup>, two National Parks with total area of 6061 km<sup>2</sup>, one Biosphere Reserve (452 km<sup>2</sup>), nine Special State Reserves (Zakazniks) with the area totalling 12,186.5 km<sup>2</sup>, and one captive breeding centre for rare animals. The total protected area in Uzbekistan is 20,520 km<sup>2</sup> which equals about 4.6 % of the Republic's territory. However, in terms of strict / long term protection (i.e. IUCN Category I and II including the National Parks, Biosphere Reserve and State Reserves) only 171 km<sup>2</sup> or 1.1 % of the Republic's territory is covered.

#### Description of Categories:

**State Reserves (Zapovedniks):** These are the oldest and most strict form of protected area. They are permanent reserves created to protect a target species or ecosystem. They are not open to any form of utilisation, with the exception of controlled scientific research, and are judged to fall within IUCN's Category I of protected areas classification.

The total area of State Reserves is 2 164 km<sup>2</sup> or over 10% of the total protected area system. State Reserves are generally small (maximum 14 km<sup>2</sup>, minimum 24 km<sup>2</sup> and average of 236 km<sup>2</sup>). All, with the exception of the largest (Gissar) are managed by the State Committee for Forestry.

**National Parks:** These are a relatively recent introduction to the system with the creation of Ugam Chatkal in 1990 and Zaamin NP in 1976. National Parks constitute 30 % of the total protected area system and 74 % of the strict / long term protected areas. The basic

objective is to provide biodiversity protection in the context of some rational and strictly controlled utilisation (tourism, hunting, timber and forest products, agriculture). These areas are judged to fall within category II of IUCN's protected areas classification.

Ugam Chatkal is located in Tashkent District in the Chatkal mountain range of the Western Tien Shan Mountains. It has an approximate area of 5,746 km<sup>2</sup> and includes within its borders Chatkal Biosphere Reserve. It also includes areas of agricultural, and urban land use and water development installations. It borders with both Kazakhstan and the Kyrgyz Republic.

Zaamin NP is located in Djizak District in the Turkestan Mountain ridge and has an area of about 315 km<sup>2</sup>. It is contiguous with Zaamin State Reserve (156 km<sup>2</sup>) and borders with Tajikistan. Both areas are managed by the State Committee of Forestry

**Special State Reserves (Zakazniks):** These are impermanent and sometimes seasonal reserves which provide a relaxed level of protection. They are often part of other land-use areas such as collective farms (kolkhoz), or forest areas (leskhoz) and are designated for finite periods which can be as short as 5 or 10 years. Though the State Committee for Nature Protection has the overall responsibility for monitoring these areas the local authority directly responsible for land use in the area has practical control and retains the right to discontinue the area as a Special State Reserve. They are therefore a rather tenuous part of the system and effectiveness of management / meeting of objectives varies. In addition, under the new economic and land use pressures that exist in the Republic, these areas are increasingly vulnerable.

Special State Reserves currently constitute over half of the overall protected area system i.e. 11,576 km<sup>2</sup> or 56%. The size of these areas varies from 10,000 km<sup>2</sup> to 25 km<sup>2</sup> but average size is comparatively large (1,447 km<sup>2</sup>).

**State Natural Memorials:** These include Natural Monuments, a Geological Reserve and

Ecotype	Area (km <sup>2</sup> )	% of total
Desert	10837	53
Desert wetlands	300	1
Mountains	8060	39
Tugai (gallery forests)	190	1
Wetlands	1131	6

an Ornithological Reserve. These are very small (average of 35 km<sup>2</sup>) and constitute 0.1 % of the overall system. State Natural Memorials are administered by State Committees for Nature Protection, Forestry and other agencies.

### ***Distribution of Management Responsibilities.***

The State Committee for Nature Protection (Goskomprroda) is made responsible by law for maintaining the integrity of the reserves system and protection regime control in specially protected natural territories. It is directly responsible for the management of two state strict reserves (one biosphere reserve; and one zapovednik), the National Captive Breeding Centre ('Ecocentre Dzheyran') and a natural memorial. In total this constitutes 62% of the system.

The State Committee for Forestry is directly responsible for the management of 2 National Parks, 6 State Reserves (Zapovedniks) and one Natural Monument. In total this constitutes 34% of the protected areas system.

Uzfish is responsible for the management of the Arnasai Ornithological Reserve which constitutes about 0.2% of the total protected areas but about 56% of protected wetland areas.

Goskomgeology (State Committee for Geology) is responsible for management of one state reserve

### ***Distribution by Ecotype and Administrative Provinces***

Over half of the overall protected areas system consists of desert ecosystems (53%). Mountain ecosystems dominate the remaining areas (34%). Wetlands include about 6% of the system and Tugai consists of about 1%. In terms of Category I and II areas, mountain ecosystems equal almost the total area, with Tugai being the only other category represented (about 0.2%). Desert, Tugai and Wetlands ecosystems are therefore extremely badly

represented in Category I and II protected areas.

Though protected areas are distributed widely within the Republic there is a significant concentration in Karakalpakstan (54% of total system) and Tashkent province (30%). In terms of Category I and II areas, Tashkent province contains the majority with 75%, followed by Kashkadarya (10%). Djizak (8.4%), Surkhandarya (3.4%), Bukhara/Korezem (1.1%) and Samarkand (0.3%) provinces.

### ***Research And Monitoring***

State Reserves (Zapovedniks) have full time scientific research staff and detailed material has been collected on all these areas from their foundation (i.e. in some cases 30 or 40 years). In addition these areas were used as a resource for students and scientists from educational institutions to carry out ecological research. Unfortunately, the majority of this work is very difficult to access and in addition was not on the whole targeted specifically at data that would assist directly in management activities. There is an urgent need to access data collected and record it in a way that will allow reasonable access and practical use of it. Currently, the research work in State Reserves has declined due to lack of financial means, hard living conditions, etc.

### **Brief Description of Individual Protected Areas.**

#### **State Strict Reserves (Zapovedniks)-Category I**

##### **Chatkal Biosphere Reserve**

Organised in 1947. Area is 45739 hectares. Of this, 6586 ha. is covered by wood, 7047 hay meadows, 81 ha. reservoirs. On territory of reserve there are 1060 species of plants, 168 species of birds and 32 of animals. The staff of reserve consist of 69 employees, 34 of them are the inspectors on protection of nature, 14 are scientific employees.

It is located in Tashkent region in western



spurs of Chatkal ridge. The main objective is to save mountain ecosystems of Western Tyan-Shan and ecological monitoring of the environment. In 1995 it was included in the global system of biosphere reserves. It is a strictly protected area.

#### **Gissar State Reserve**

Organised in 1983 Its area is 80986.1 hectares. Of this 12203 ha. are covered by forestry, 27450 ha. by meadows, and 17 1 is made up of reservoirs. There are 870 species of plants and about 140 species of animals inhabiting its territory. The staff of reserve equals 56 employees, of which 35 are state inspection on protection of nature, 8 scientific employees.

Gissar is located in Kashkadarinskai area, on western spurs of Gissar ridge. The objective is to save natural complexes and ecosystems of Gissar ridge.

#### **Zaamin State Reserve**

Organised in 1960. The objective: protection and scientific researches of archa woods with the endemic fauna.

Located on the northern slope of Turkestan ridge, in Zaamin region of Djizak region. Area is 15323 hectares, of which 6763 ha. are covered by woods. The protection is realised by state inspection for protection of nature amounting to 22 men. The reserve is contiguous with Djizak (Zaamin) National Park.

Under protection there are mountain fir-tree ecosystems within altitude of 1760 to 3500 m. above sea level.

Three vegetative belts have been identified: mountain steppe, wood and alpine zones. More than 700 species of plants have been recorded. Zerafshan, semi-spherical and Turkestan Archa (Juniper) are the basic species of the forest.

#### **Nuratau State Reserve**

Organised in 1975. Located on northern slope of Nuratau ridge in Farish district of Djizak

region

Objective - saving of the valuable varieties of walnut and protection of a unique population of Severtzev Sheep, included in the Red Book of MSOP.

Area of reserve is 17752 hectares, of which 2696 ha. is covered by wood. Personnel - 29 state inspectors.

In the reserve, apart from the walnut trees there are more than 650 species of plants, some of which are endemic. Relict species include rare forms of Zerafshan Archa and Regel's pear-tree.

#### **Surkhan State Reserve**

Consists of two independent sites:

1. Aral-Paigambar (at the moment the activity is stopped because of complex political conditions) organised in 1971, typical for valley-tugai ecosystems of Amu-Darya river. Area is 3093 hectares, 964 of them covered by wood. The reserve is created for saving typical tugai wood with its characteristic fauna
2. Kugitanskiy - organised in 1987, covering mountain and forest ecosystems. Area: 24583 hectares. Typical of mountain ecosystems of Kugitang ridge. On the site there more than 800 species of plants, about 290 species of birds. and more than 20 species of animals have been detected. Under special protection are the Spiral Goat (280 head), mountain sheep (36 head) and other rare species. Protection staff - 25 inspectors.

As a whole the reserve is in Surkhan-Darya area and is typical of natural environments of the south of Uzbekistan.

#### **Kyzylkum State Reserve**

Organised in 1971, in Bukhara area. Area of reserve is 10141 hectares, of which 6964 hectares in sand zone and 3177 hectares is in the Amu-darya's flood lands. Special attention should be paid to the Bukhara rare deer - number of which has grown since 1971 (20 head) up to 200 head. Protection - 10

## inspectors

### **Baday-Tugai State Reserve**

**Organised in 1971** in the Republic of Karakalpakstan. Area - 6462 hectares.

Located downstream on the right bank of the Amu-Darya river on territory of Beruni and Kegelli districts. The reserve was created with the purpose of saving tugai woods and fauna in conditions of regulated drain of the Amu-Darya river. Tugar forests take over 70 % of its area.

Fauna is represented by: more than 91 species of birds, 15 species of mammals, 15 species of fishes. In 1975 , three heads of Bukhara rare deer were brought to the reserve, and in 1995 their number reached 18, of which 6 in 1996 were moved to Zerafshan reserve.

### **Zerafshan State Reserve**

Organised in 1975 in Samarkand region. Area: 2352 hectares, 868 of them covered by wood, 725 not covered by wood. The Reserve is a narrow strip stretching along the Zerafshan river for as long as 45 km

Objective of reserve is the protection and restoring of tugai ecosystem and in particular saving of sea-buckthorn and population of rare subspecies of Zerafshan pheasant, the number of which in 1995 has reached 4000. Protection - 8 inspectors.

## National Parks - Category II

### **Djizak (Zaamin) National Park**

Organised in 1978 in Djizak district on the northern slope of Turkestan ridge. The park is organised with the purpose of saving, restoring and recreational use of unique mountain juniper ecosystems.

The overall area of the park is 30522 hectares, with forests make 2 1396 hectares, 16689 covered with wood, and 9 126 non-forest land. Two zones are defined: recreational and buffer zones. Protection: 15 inspectors. The NP is contiguous with Zaamin State Reserve.

### **Ugam-Chatkal National Park**

Created in 1990 in Tashkent region in mountain area in spurs of western Tyan-Shan with an area of 574,6 thousand hectares, 56.4 thousand of them covered by wood, 177,3 thousand ha. pastures and hay-lands, 1,6 1 thousand ha. irrigated land, 329,4 thousand ha. rock and bare slopes. It is currently still awaiting legal gazetting.

It was organised with the purposes of saving unique landscapes, use of them for recreational purposes, and also to regulate economic activity of land-owners and land-users located there. Protection - 53 inspectors.

The whole territory of the park is divided into functional zones (thousand hectares):

- agro-park zone - 59,1;
- active recreational zone - 30,7;
- regulated recreational zone - 13,6;
- reserved zone - 35,8;
- a zone treated as a reserved zone - 109,1;
- zone of natural landscapes - 326,1;

Within the scheme the lands of forestry farms are: wood fund - 322,6 thousand hectares and forest cultivation - 620 hectares.

## Rare Animals Nurseries

### **National Captive Breeding Centre**

One of the most effective forms of protection of nature and saving of biodiversity is the creation of nurseries for breeding of rare species of animals.

In Uzbekistan at the moment there is an officially operating Republican centre on cultivation of rare species of rare animals i.e. the Dzheyran Eco-center, organised in 1976 in Bukhara region on a area of 5 145 hectares. Its purpose is the artificial cultivation of rare species of animals, in particular jeyran (gazelle), beauty bustard, Przevalsky's Horse, Kulan ( wild ass), and other species included in the Red Books of IUCN and the Republic of Uzbekistan. Protection - 8 inspectors.

Table W: Specific structure and number of rare species of the animals living on the territory of Jeyran Ecocenter (1996)

Species	Numbers
Jeyran (gazelle)	621
Przevalskiy Horse	11
Kulan (wild ass),	16
Deer	2
Saigak	1
Bustard	8

### Resources Available For Protected Areas System

The table below (table X) indicates staff and financial resources allocated for Category I and II reserves in 1986. It does not include headquarters staff or financing.

Forestry USD 202,833 or about USD 25/ km<sup>2</sup>

Currently lack of sufficient resources is undoubtedly the major immediate problem faced by protected areas managers.

Table X: Staff and Financing of Category I and II Protected Areas (1996)

Area	Staff	Actual Costs in 1996 (sum)	USD Equivalent (60:1)
<b>SC Nature Protection</b>			
Chatkal Biosphere Reserve	69 (34 protection, 14 science, 21 other)	1,817,000	30,283
Gissar State Reserve	56 (35 protection, 8 science, 13 other)	1,600,000	26,667
Dzheiran Ecocentre	8	1,263,000	21,050
Total	133	4,680,000	78,000
<b>SC Forestry</b>			
Zaamin State Reserve	22	1,420,000	23,667
Surkhand State Reserve	25	1,420,000	23,667
Zerafshan State Reserve	8	1,900,000**	31,667
Nuratau State Reserve	29	1,330,000	22,167
Kyzylkum State Reserve	10	900,000	15,000
Badai-Tugai State Reserve	?	1,500,000	25,000
Ugam Chatkal NP	53	2,270,000	37,833
Zaamin NP	15	1,430,000	23,833
Total	162	12,170,000	202,833
Overall Total	295	16,850,000	280,833

The State Committee for Nature Protection has 133 members of field staff in an area of about 1317 km<sup>2</sup> (i.e. one person / 9 km<sup>2</sup>). The State Committee of Forestry has a total of over 162 field staff (no figure is available for Badai-Tugai SR) and thus an average field density of about one person / 42 km<sup>2</sup> (in an total area of about 6905 km<sup>2</sup>). Total financial resources allocated in 1996 equalled approximately USD 280,833 at the official exchange rate of that time (USD1:60 Sum). Areas under the State Committee for Nature Protection received USD 78,000 or about USD 59/km<sup>2</sup> and areas under the responsibility of State Committee for

### 5. Problems For Protected Areas and Management

#### Protected Areas Coverage and Distribution:

In regard to the overall protected areas system there is a reasonable coverage of the Republics ecosystems and habitats, with perhaps the exception of tugai and habitats typical of the Amu Darya Delta and Aral Sea zone. However, in terms of Category I and II areas (Zapovedniks and National Parks) coverage is very poor with all ecosystems, except

mountains, being badly represented or not represented at all (i.e. tugai, desert and wetlands). This imbalance has to be addressed.

### ***Size and fragmentation***

International recommendations for the extent of protected areas necessary to ensure adequate conservation of biodiversity and the maintenance of vital ecological processes, is around 10% of total land area. Uzbekistan currently contains not more than 4.6% of protected areas, of which only 1.8% are classifiable as Category I and II areas.

With the exception of the National Parks, many of the protected areas in the Republic are considered too small to ensure the viable maintenance of ecosystems, particularly in desert areas and particularly Category I areas (State Reserves). In addition to their small size, many areas are widely dispersed and largely surrounded by areas of low biodiversity value, thereby reducing the possibility of maintaining their ecosystems via biogeographical processes.

### ***Institutional / management problems***

#### Divided Institutional / Management

Responsibilities: A large number of institutions and organisations have some level of responsibility for protected areas, including the State Committee for Nature Protection (SCNP) and State Committee for Forestry (SCF) who have the main role, but in addition there is Uzfish, and all other organisations upon whose territory Special State Reserves (Zakazniks) are located.

This situation results in a number of critical problems, including a lack of clarity and uncoordinated implementation of policy and planning, duplication of staff and activities, competition and confrontation over control and access to resources, etc. This is undoubtedly damaging and is limiting the development of biodiversity protection efforts in the Republic. It is an issue that must be addressed in the short term if a unified biodiversity policy and programme is to be effectively implemented in the future.

Financing: Under the current economic

situation all sectors of government are experiencing a reduction in financial resources, but this is particularly the case for protected areas management. Historically, protected areas have had few economic mechanisms for generating their own financing (through tourism, hunting etc.) and are thus largely dependant on central government inputs. Devaluation has meant that these are not sufficient to adequately maintain protected areas.

Staffing: Due to the changing economic situation the protected areas system has lost a large number of skilled personnel, particularly scientific staff.

Training: No facilities for the specialised training of either senior or junior protected areas staff currently exists in Uzbekistan. Current senior staff have received either training as foresters or academic university courses in biology and related subjects. Field (inspection) staff receive little or no training. There is therefore a need to develop a cadre of personnel at all levels with specialised and practical training specific to the planning and management of protected areas.

Research and monitoring: Research and monitoring within State Reserves (zapovedniks) as been extensive and carried out over long time periods. However, its objectives were generally purely scientific and not targeted towards any particular management objectives. In addition, little analysis and collation has taken place with the result that it is extremely hard to access the vast amounts of data that have accumulated. In Special State Reserve research and monitoring has been limited or non-existent.

Protected Areas Management Plans: Though management plans do exist for all or most protected areas they are limited in content and do not compare with what is generally considered necessary internationally for effective management.

### ***Public / community and NGO Participation in Protected Areas***

Public awareness of biodiversity issues and protected areas is currently not high. In light of

the serious environmental problems facing the country and the importance's of biodiversity services in the stabilising / maintaining of basic ecological processes, this situation should be addressed.

### ***Strategic, policy and legal aspects***

Historically, the protected areas system has developed on an area by area basis without a strong unifying strategic target or long term development plan. For example, State Reserve have been created with very narrow objectives (i.e. protection of specific species/habitats) but without reference to an overall development plan. Likewise; the initiation of the National Park concept, with emphasis on recreation / tourism and mixed land use approaches, has occurred mainly through the initiative of organisations and individuals involved rather than from a strategic plan.

General economic and political condition in Uzbekistan have changed significantly since the break-up of the Former Soviet Union and the gaining of independence. The government has shown during the years since independence a significant commitment to furthering the protection of biological resources through: creation of some new areas, issuing of new legislation and membership of the International Convention on Biodiversity. However: this has occurred in a rather ad hoc manner and there is now a need to consolidated and crystallise under a unified and clear cut plan the objectives, strategies, institutions and legal frameworks for the further long term development of biodiversity protection and utilisation in the Republic.

### **6. Other Existing Conservation Measures**

Use of biological resources is regulated by a range of legal controls including "Forest Code" (26.07.78), "Law On Protection of Nature" (9.12.92), "Law On Natural Resources" (22.09.94). In addition, there are a number of relevant special "Resolutions of Parliament" such as: the Resolution on greater protection of valuable and vanishing plants and the regulation of their use (03.09.93); Resolution about measures on strengthening of protection

of wild animals and plants and regulation of their use (15.12.93); Instruction on import/export of predatory birds (11.02.96); Ordinance on hunting (01.04.91).

GOSBIO-KONTROL, the State Biological Control Service is the main agency responsible for ensuring regulation of biological resource use in accordance with laws and resolutions, for setting quota's in accordance with expert advise of the Academy of Science, and for issuing licences for exploitation on the basis of set quota's

There is a uniform licensing system for hunting of animals and catching of fish in Uzbekistan. Licenses (permissions) for individual pleasure hunters and fishermen are issued by the Society of Hunters and Fishermen. State and commercial organisations, as well as foreign citizens get licenses from the GOSBIO-KONTROL (the State Biological Control Service) under GOSKOMPRIRODA (the State Committee for Nature Protection).

Export of wild animals in Uzbekistan is done in compliance to the International Rules of Trade of Wild Animals, with licenses issued by CITES. The only species said to be currently exported in significant number is the Central Asian tortoise. Fifteen thousand animals were exported in 1995 and 7,500 in 1996 (according to quotas in effect during those years).

Of other animals, only song and decorative birds bred in private collections are officially moved out of the country.

No detailed assessment as to the effectiveness of current regulation has been carried out to date but it is likely that under the current financial / manpower limitations and the transitional legal phase, regulation is not highly effective. In particular up-to-date evaluation of the true market values of utilised biological resources is needed to ensure effective fee / penalty levels.

The table below describes illegal activity identified during 1995 and penalties imposed. It is unknown how accurately this reflects the overall true level of illegal activity occurring in the Republic.

Table Y: Assessment of Illegal Trade Occurred in 1995

Category	Number of disclosed violations	Fines imposed (sums)	Suits recovered (sums)
Hunting	579	60,698	105,658
Fishing	2,215	194,289	258,440
Related to Flora	1,937	207,529	748,549
Total	4,731	454,720	1,112,656

Numbers of state and voluntary inspectors are 163 and 174, respectively.

Fines are imposed for violation of legislation on nature protection. Suits are filed for the damage caused to biological resources. The GOSBIOKONTROL (the State Biological Control Service) does not have data available as to the species profile of animals and plants acquired illegally.

### *Ex-situ Conservation*

There are two zoological gardens (one in Tashkent, one in Termez) and a botanical garden (Tashkent) in Uzbekistan.

### **Description of the Tashkent zoo and the Botanical garden**

**The Tashkent zoological garden** was founded in 1924 by a group of zoologists from the Central Asian University as a research/education establishment. One hundred and twenty four species are kept on the territory of 3.2 hectares. Basic direction of its activity is the creating of collections of rare and endangered animal species included in the International and Republican Red Book, their captive breeding, and increasing people's awareness of the country's wildlife.

Despite the low diversity of the collection, the last years' trend was toward increased number of visitors. In 1996 the Tashkent zoo was visited by 180,000 people vs. 100,000 in 1995.

A new zoo, created on a portion of the Botanic garden's territory, was publicly opened in Tashkent on 1<sup>st</sup> of September, 1997. The design of the new zoo fully complies with international rules and regulations in the field.

As the international practice prompts it, the country's zoos should become research centres for conservation, breeding and re-introduction of rare/valuable animal species rather than confining their activities to public entertainment and education on wildlife.

**The Botanic garden: Named after** academician F. Rusanov. it was organised in 1922 on the area of 8 hectares and originally belonged to Central Asian State University. Since 1944 it has been managed by the Academy of Sciences. In 1953 it was transferred to a new site with an area of 80 hectares.

Since 1968 it has had the status of a research institute. It includes 5 laboratories, namely laboratories for introduction of overseas flora, introduction of local flora and protection of rare and disappearing plants, introduction of flowers and decorative assortment. medical botany and industrial botany.

There are studies on species requiring much effort for reproduction, for preservation of rare and disappearing species, their duplication, and introduction in nature.

In the collection of live plants more than 6000 species, forms and species from the temperate zone are collected. The collection of dendroflora contains 2500 species including 170 coniferous, and 2200 grassy species.

The basis of the Botanic garden is its dendro-park, exhibits of grassy plants, and sites of reproduction of useful plants. Paths are laid through all this mainly intended for excursions and recreation.

Table Z: Structure of dendra-flora of the Botanic garden

Zone	Area (ha)	Number of species	
		1960-70's	present time
Eastern Asian	8	1000	600
Far Eastern	4	300	170
Northern American	9	600	460
Crimean-Caucasian-European	5	400	300
Central Asian	14	200	117
Total	40	2500	1647

The Botanic garden has accumulated significant scientific experience in the introduction of flora of Uzbekistan and other regions of the world. From the territory of Central Asia studies on introductions have involved about 2000 species from 41 families of plants.

rare and disappearing species of plants of Central Asia.

About 400 new decorative plants, wood, fruit trees and medicinal plants, bushes and grassy plants have been introduced into the national economy.

Table AA: Collections of Animals

Profile	Holder	Volume (000 examples)	Contents
<b>Vertebrates</b>			
Stuffed Birds	Tashkent state University, Tashkent City	20.2	563 species from 19 orders. Many are represented by series. 241 new description 71 species/subspecies.
	Institute of Zoology, Academy of Sciences	5.6	341 species from 18 orders
	Nature Museum, Tashkent city	1.4	224 species from 14 orders
Birds' Eggs	Tashkent Sate University	662 laying	from 111 species representing 9 orders
	Nature Museum, Tashkent city	54 laying	from 39 species representing 9 orders
Stuffed Mammals	Institute of Zoology, Academy of Sciences	6.7	83 species from 6 orders. Kept as skulls/skins
	Tashkent Sate University	2.6	93 species from 7 orders
Mammals' Skulls	"jeyran" Ecocentre	0.244	Skulls of animals died on the territory of the Ecocentre
Reptiles	Institute of Zoology, Academy of Sciences	16.0	70 species altogether including 44 species of lizards, 22 snakes, 2 tortoise's, and 2 amphibians'
<b>Invertebrate</b>			
Insects	Nature Museum, Tashkent city	335 0	472,000 examples are systematised. Insecta and Chelitserata classes
Ditto	Institute of Zoology, Academy of Sciences	5.5	Representatives of three orders: straight-winged, semihard-winged and tail-winged. Beetles are represented most: 17 families
Parasites	Uzbekistan anti-plague station	100.0	Rodent's fleas and 3 groups of ticks. About 30% - embalmed preparations, 70 % - wet preparations.
Live spiders	Institute of Zoology, Academy of Sciences		10 spider species of Central Asia. Exists for more than 10 years.

There were and still are activities being conducted on study of filogenesis of plants. In the last 20 years activities on study of medicinal plants were conducted, including both local and overseas plants. A significant attention is given to introduction of endemic,

During 1996 the Botanic garden was visited by 21,000 people.

### Scientific Collections

It is worth while to note the significance of creating not only live collections, but also

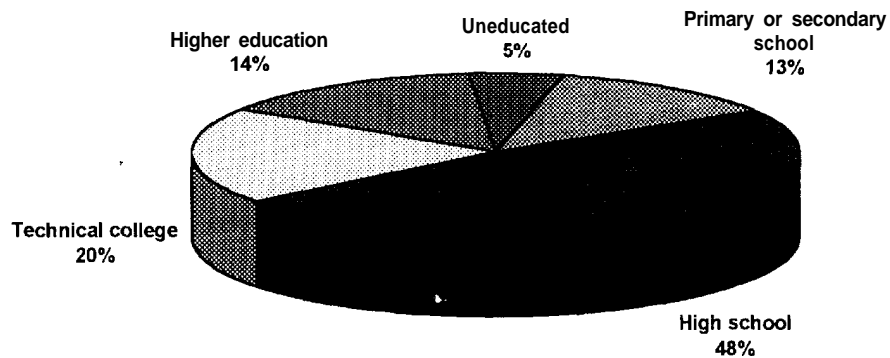


Figure C: Education Breakdown

scientific and educational ones

The activity with collections is a very necessary component of measures for monitoring and preservation of biological diversity. Uses include:

- a major source of information for assessment of natural diversity of flora and fauna of the region;
- allow to objectively characterise change of flora and fauna for a historical period;
- study of geographical and population variability, drawing up of distribution maps;
- are necessary for identification of biological species while conducting research activities and examinations;
- are a database for drawing up of the directories, monographs, popular scientific activities;
- are necessary during nature protective training and educational activity.

It is expedient to distinguish scientific collections, represented by rather extensive collections (made according to scientific standards and intended for the research purposes), from educational collections (collected and prepared for educational and training purposes).

**Other Activity:** Since 1991, the State

Biological Control Service has been implementing, jointly with JV 'Denis,' a project for captive breeding of Saker falcons. During the last 5 years 27 chicks have been successfully reared. In 1996, for the first time ever, 11 examples were reintroduced into their natural habitats. Based on the same centre, a similar project dealing with Houbara bustard has recently got underway.

## 7. Education, Training and Public Participation

Uzbekistan has a highly developed education system with almost full literacy and high school / higher education facilities (figure c).

The structure of the country's educational system is formed by pre-school organisations, schools, technical colleges, universities and university-level institutions.

The school system is divided into primary-level education (4 years), secondary school (9 years - 'incomplete school'), and high school (11 years - 'complete school'). The system of professional education consists of technical colleges, colleges, and professional schools.

Education in the field of biology involves basic programs in schools and specialised curricula in universities and colleges.



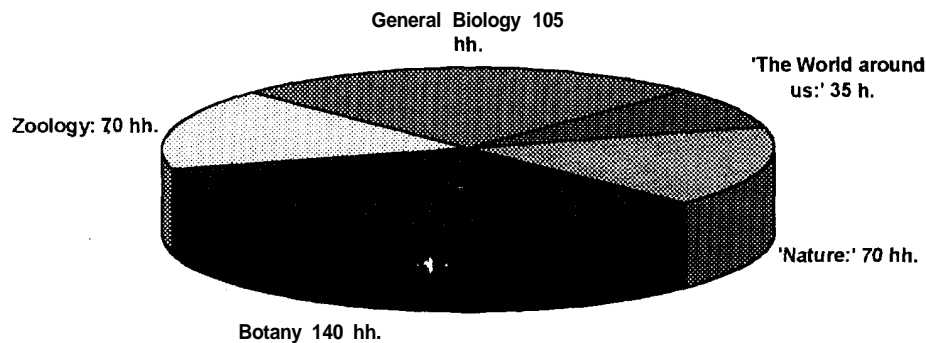


Figure D: Biodiversity-related Programmes in Regular Schools

The system of school education has specialised schools with a more detailed teaching of certain subjects. However, there are few schools stressing biology/ecology in their curricula (in the capital Tashkent 1.5% for ecology and 6.7% for biology.)

In terms of the system of professional schools, only a few have biology/ecology related courses in their curricula. Generally these are not major courses for students.

At the level of higher education ecology and biodiversity related programmes are concentrated in biological departments of universities and in medical and agricultural schools. Twelve higher education institutions have ecology chairs.

The Biological departments of state universities educate specialists majoring in 'biology' and 'ecology and nature protection.' Forestry specialists are educated at the Forestry Department of the Tashkent Agricultural University.

Uzbekistan totals 8919 regular schools, 47 professional schools, and 55 higher education institutions.

**Legal provisions for education.** The law 'On education' of the republic of Uzbekistan (July, 1992) states a mandatory 9-year basic

education and provides for opportunities of free professional and higher education. It also allows for fee paid professional and higher education.

Up to 7 languages of instruction are used in the regular school system. However, professional and higher education uses only Uzbek and Russian.

The Cabinet of Ministers is made legally responsible (article 9 of the law 'On nature protection' (Dec., 1992)) for creating systems of ecological awareness and education. There are no special laws on ecological education.

**Administrative management.** Regular schools are managed by 5 ministries/agencies (mostly the Ministry of Public Education), professional schools exist in the structures of 22 ministries/agencies, and higher education institutions belong to 12 ministries/agencies (mostly the Ministry of Higher Education).

**Methodical guidance in education** is carried out by two ministries: the Ministries of Public Education and Higher Education. Every course taught must comply with an approved programmes. The Republic's educational organisations currently suffer a lack of textbooks, teacher's guides, computers, charts/maps/educational equipment, etc., particularly in the Uzbek language.

Funding of educational system. About 10 to 12% of GDP is spent on education. The shrinkage of resources has become noticeable among educational organisations, particularly regular schools. Teachers wages are low (60% of the average for the entire national economy). Sponsorship in the state educational system is underdeveloped.

Expenses occurring in the system of paid education are covered by students/trainees. There is a training system for the specialists from different fields related to biodiversity. Nevertheless, training programmes currently have narrow, agency related focus and do not address issues of biodiversity or sustainable use of natural resources.

Informal ecological education and awareness. A significant role in promoting an ecological 'vision' of the world is played by various NGO's, circles, clubs, and ecological Sunday schools. These tend to be concentrate in large cities (Tashkent, Fergana, Nukus). Funding sources for them can be membership fees, charity, and various donor organisations.

Staff. In 1994, 42,000 teachers were employed out of the school system, while schools experienced a severe shortage of instructors (including deficit of 2,700 biology teachers).

Major problems:

- gaps in legal provisions for bio/ecological education
- non-existence of the strategy for bio/ecological education
- scarcity of non-monetary resources in educational organisations
- deteriorated quality of specialists' education due to the shortage of professors/teachers
- non-existence of an out-of-school ecological education system
- severe lack of textbooks and methodological literature
- non-existence of the training system for protected area specialists/management
- economic difficulties of the transition to a market economy resulting in many research/teaching personnel quitted their

positions, faded interest in pursuing career in the field of biology among youth, and less student enrolment into the programmes at technical colleges and universities

- training system is scattered by agencies and is thus not effective in terms of biodiversity conservation.

#### NGO's and Public / Private Participation in Biodiversity Protection

Introduction: There are more than 30 environmental/public health NGO's in the country, 13 of which are officially registered. The largest are the International Foundation "Ecosan" and the Red Crescent's Society, which have direct governmental support. Membership of other NGO's is limited (2 to 20 people). There are many spheres of NGO activities connected with biodiversity conservation involving environmental conservation issues per se and eco-education, information and propaganda.

#### Non Government Organisations (NGO's)

NGO's are a comparatively new concept in the country and as a result both lack experience and are not entirely trusted by the government system or widely utilised by international development organisations.

Within the current political and legislative context, problems faced by NGO's include:

- ◆ a lack of adequate or appropriate legislation to accommodate the legal and financial status of NGO's. This is probably the greatest practical obstacle to NGO development in the Republic.
- ◆ a lack of overall support to NGO's in the country, with the exception of a limited number of government sponsored organisations.
- ◆ lack of access provided to NGO's in terms of information, decision making processes and participation.

Within the NGO movement there can also be identified a number of problems and

limitations, including:

- narrow membership bases within country and a high dependence on support and financial resources from outside the country
- a general lack of organisational and managerial experience and an absence of democratic traditions.
- generally a lack of clear cut focal areas and overall unity of organisation

However, NGO's do have some very significant strengths, particularly in environmental /ecological fields and often in areas where state organisations lack capacity. For example:

- = NGO's have developed a high level of regional and international contacts / support and gained experience of working relations with international organisations.
- = NGO's have developed an effective regional and international communication network
- = Environmental NGO's have a much greater awareness than most state personnel or the general public of up-to-date development concepts, international instruments / legislation and international experience in trying to address environmental issues.
- = NGO's, generally, have a much higher level than state personnel of computer literacy and technical capacity in terms of utilising computers for communications and information processing / distribution.
- = Environmental NGO's have a membership with a solid core of qualified scientific and education specialists.

In the light of the above, the following areas have been identified where NGO's can make a substantial contribution to biodiversity conservation and sustainable use:

- = The development and implementation of

awareness and education programs and activities.

- = **The** development / catalysing of participation by people both at general public and local levels
- = The accessing, collection, analysis and distribution of traditional knowledge and customs which have biodiversity conservation or sustainable use benefits.
- = Provision of an independent environmental monitoring and "watchdog" function in the Republic to help ensure the compliance of the state and private sector to environmental and biodiversity related laws and regulations
- = Provide essential communication and networking capacity to assist local and regional co-operation and integration of activities.
- = Assist in developing the awareness, co-operation and the assistance of international organisations on biodiversity issues in Uzbekistan / Central Asia.
- = Provide essential technical inputs and assistance to relevant biodiversity state organisations in the field of computer based information management and communications.
- = Provide inputs / review for policy, program and project development in the protected areas and sustainable use sector utilising their awareness of international development

However, before NGO's potential for the development of biodiversity conservation and sustainable use can be fully realised, it will be necessary for the government to complete relevant legislative reform and for state organisations to more fully recognise/involve NGO's in activities. In addition, NGO's will need to develop a broader membership, and improve their resource base and management capacity. International development agencies

and the government will need to support this process.

# Part 2. National Strategy for Biodiversity Conservation

## *Analysis*

The following is a brief summary of the critical issues facing biodiversity maintenance and use in Uzbekistan and its importance in relation to the country's long term sustainable development.

### **1. Analysis of General Economic and Socio-political Context**

- The main feature of Uzbekistan's past development has been its inherently unbalanced approach, with too much emphasis on production sectors, particularly agriculture, and insufficient inputs to control and protection sectors. This has resulted in the "mining" of natural resources rather than their renewable use. A contributing factor has been the highly centralized planning/management approach.
- Uzbekistan's biological resources, in common with other Central States, have undergone a drastic reduction in the past 30 / 40 years resulting in the total destruction of some ecosystems, the serious endangerment of others. and a threat to the overall continued ecological stability of the Republic.
- In view of the Republic's population growth and other factors, continuation of current production systems cannot meet Uzbekistan's future development needs; firstly, because they are environmentally unsustainable; and secondly, because they have already reach close to their maximum potential with full use of limited resources such as water.
- New production systems capable of meeting the development needs of the Republic must firstly, be more efficient in terms of productivity; and secondly, must be sustainable.
- Within the above context, the true value of biological resources in the Republic, both in terms of their role in maintaining vital ecological process upon which agricultural and environmental conditions are dependent and their actual/potential direct sustainable use, is insufficiently evaluated and considered by current development policies and plans.
- For the Republic to achieve future sustainable development. adequate consideration and inclusion of biodiversity conservation and sustainable use objectives must be made in national development planning, including allocation of necessary institutional and financial resources.
- The economic and Socio-political transition period is a time of threat for the development of biological resources conservation and sustainable use - yet it also provides the opportunity for the creation of a new system for conservation and a new policy / approach to use.

To make use of this opportunity and achieve the basis for future sustainable development the Republic must ensure that the protection and sustainable use of biodiversity is a priority development issue and that adequate financial and institutional resources are allocated.

### **2. Analysis of Protected Areas System**

**Legal:** Past legislative regulation of natural resource use and environmental protection was designed to meet the needs of past development policies and thus placed inadequate emphasis on

ensuring rational use and protection. Since independence numerous new items of legislation have been passed in an effort to provide a more appropriate legislative base for environmental management and resource exploitation, much of which is relevant to protected areas status and management. Though this new legislation is clearly of benefit, the rapid and "ad hoc" nature of its development inevitably leaves gaps and inconsistencies. Further legal reform and development is required not only to address such gaps / inconsistencies but also to deal with the rapidly changing situation resulting from ongoing reforms.

**Concept and Design:** At independence Uzbekistan's protected areas system was a product, on the one hand, of the long Russian tradition of Strict Nature Reserves (mainly ad-hoc areas targeted to protect specific species/habitats) from which few tangible benefits derived and, on the other hand, former development policies which undervalued the importance of environmental protection. Protected areas were therefore highly marginalized entities, valued mainly by specialized scientists, professionals and enthusiasts but largely insignificant to government planners, decision makers and the public. The protected areas system was thus ill adapted to face the challenges brought by the collapse of the soviet system and the transition to a new political and economic future.

Critical problems that face the protected areas system fall into three categories:

- its inability to meet basic biodiversity conservation objectives (i.e. due to poor ecosystem coverage, ecologically non-viable sizes, fragmentation);
- the lack of understanding and awareness at all levels in the Republic (decision makers, planners, general public) of the value and importance of biological conservation and rational use for the development of the country;
- the protected areas system's lack of future economic and social sustainability under the new political and socio-economic conditions.

Though positive steps have been undertaken since independence in regard to the development of a new system and approach to protected areas design and management, this has largely resulted from initiatives within institutions directly involved rather than as a result of overall national policy change. Within government understanding of the issues involved and their importance to the national development is still not extensive. Thus, to be successful, it is now critical that protected area's development is placed into a national level strategic plan which is fully endorsed and supported by government at the highest level and becomes a nationally and internationally recognized component of the Republic's overall sustainable development policy.

**Institutional Responsibility and Management:** An assessment of institutional and management problems for protected areas was provided previously. The development of the new protected areas system will not be an easy undertaking and to be successful the problems indicated must be quickly addressed, particularly regarding: clarification of institutional responsibilities; improvement in the conditions of service of staff; and increasing the professional and managerial capacities of staff.

**Financing:** Another critical factor during the development phase of the new system will be provision of adequate and reliable financing until such time as it is established and becomes, to at least an extent, self sufficient. The allocation of financial resources for biological resources conservation and the protected areas system has historically been a low priority within past development policies which were production orientated and paid inadequate attention to environmental concerns. This situation has been greatly worsened since the transition period started due to shrinking central government finances and drastic devaluation, in real terms, of allocated resources. Thus by 1996 total expenditure on State Reserves and National Park system (IUCN category I and II areas) equaled only 16,850

thousand sum (about USD 280,000 at official exchange rate) which is equivalent of about 0.003% of total central government expenditure or about USD 34 per km<sup>2</sup>. This compares extremely badly even with some of the poorest countries in the world. For example, per km<sup>2</sup> of protected area Ethiopia spends about USD 57, Ghana USD 237, and Zimbabwe USD 277 (Bell and McShane, 1985).

### **3. Analysis of Public Awareness, Education and Public/Community Participation:**

The long history of unsustainable development policies has conditioned the national perception regarding the environment and influenced the education system. Thus, despite a high educational level in the Republic and the occurrence of disastrous events such as the “Aral Sea Crisis”, there is a poor awareness and understanding of basic ecological processes and their importance to the country, particularly at the bureaucratic and decision making level within government, managers within the production sectors and the general public. The higher education system focuses on either production or pure science without adequate development of environmental management aspects. Primary / secondary education places too little emphasis on the understanding of fundamental ecological processes and their relation to development. Past public / community participation in biodiversity conservation has been limited partly through lack of awareness, but also due to the exclusion of the public from protected areas management and the difficult political / legal environment for NGO's.

### **4. Analysis of Sustainable Use**

**Biological Services:** Uzbekistan is primarily an agricultural nation and therefore has a high dependence on the quality of its environment. However, in the past there has been a serious undervaluing of the indirect services provided by biological resources, in terms of maintaining / stabilizing ecological processes and environmental quality in the Republic. and the critical role they play in its overall development. This has contributed to bringing about the creation of such situations as the Aral Sea disaster.

**Direct use:** In Uzbekistan direct use of biological resources is occurring in terms of hunting, collection of valued plants, and other uses. However, there has been no detailed evaluation as to the full value of such use or the full potential in Uzbekistan for sustainable use of biological resources. Growing global experience indicates that this is a sector that, if rationally developed, will provide many economic and developmental benefits for the Republic.

### ***Strategy Statement***

In the light of the above analysis the critical areas the national biodiversity strategy must address have been identified; in order of priority, as follows.

#### **1. The Protected Areas System**

It is recognized that the currently existing protected areas system in Uzbekistan has limitations in regard to its overall size, representiveness, conceptual approach, financing, legal framework and management / institutions. It is also clear that Uzbekistan has undergone a very serious decline in its biodiversity in the past 30 years which threatens the continued viability of ecosystems and the countries prospects for sustainable development.

To not only survive but also to expand, as is clearly necessary to meet conservation needs, the protected areas system must develop a conceptual and methodological approach which meets new socio-economic and political realities. It must be able to justify its cost (both financially and from exclusion of other use) by providing clear benefits to national sustainable development - it must limit the extent of those costs by providing economic and social benefits to citizens of the republic, particularly those living in or around protected areas - and it must ensure the conservation of biodiversity and natural landscape essential for the economic, social and cultural needs of future generations

Thus, a review, reorganization and expansion of the protected system will be carried out over a five year period (1998 to 2002). During this activity the guiding principles and targets will include:

- Use of an ecosystems approach to the creation of the new protected areas system: The past concentration on high profile or endangered species for protected areas selection has contributed to the current unrepresentative system.
- A target of a protected areas system which covers a minimum of 10% of the total land area of Uzbekistan: Currently, the protected areas system covers approximately 2% of the Republic's total land area. Though at the present time there is insufficient data available to be able to determine the exact extent of coverage necessary to achieve biodiversity conservation requirements, current levels are clearly inadequate. In the absence of this data, the international recommended figure of 10% protected areas coverage is being adopted for the initial strategic planning period of 10 years.
- An integrated "mixed use" approach to protected areas expansion and development: Since independence there has been a move away from the previous approach of total protection typified by State Reserves (zapovedniks) towards zoned and mixed land use areas within National Parks. The rationale behind this change of approach is twofold - firstly, it is recognized from both international and local experience that the expansion and maintenance of totally protected State Reserves (Zapovedniks) will prove problematic in the future due to financial costs and increased demographic and socio-economic pressures - secondly, the development of mixed use protected areas, in addition to being more likely to achieve long term conservation goals, will also provide the basis for the development of models for the sustainable utilization of biodiversity which can be duplicated in the rest of the country. Thus this approach will be further developed and will form the basis for the new protected areas system. It should be emphasized that State Reserves (zapovedniks) will continue to play a key role in the system forming the core conservation zones of newly created protected areas. Likewise, Special State Reserves (Zakazniks) and other category IV areas will be incorporated into the new system.

## **2. Public Awareness, Participation and Education**

For the strategy to be successful it is essential that sufficient awareness and understanding of the conceptual basis, benefits and needs of biodiversity sustainable use and conservation are conveyed to all levels of the general public, particularly decision makers, local government administrators and communities close or within protected areas and the youth of the nation. In addition there is a need to encourage the participation of the public in conservation and sustainable use of biodiversity as this will be the most effective means of engendering understanding and genuine public support for actions required to conserve biodiversity.

It is recognized that this process will take time and will be a component of a general deepening understanding and awareness of the country for environmental issues. However the strategy identifies priority actions required to begin this process including: increasing the knowledge base of decision makers; developing appropriate media and local awareness programs; revision and development of school and university curricula; and development of public participation mechanisms in protected areas.

## **3. Sustainable Use**

Though elements of sustainable use of biodiversity resources, such as regulated hunting, collection of medicinal plants, etc., are already developed in Uzbekistan, the overall conceptual approach, incorporating the multitude of economic and non-economic benefits, is comparatively new. A "step by step" approach to the strengthening and development of sustainable use mechanisms will therefore be used starting with the strengthening and refining of existing regulatory aspects, and the development within the protected areas systems of sustainable use approaches which maybe applicable outside at a



later point in time. In addition, during the initial implementation of the strategy, investigations into realistic and appropriate sustainable use options will be undertaken on the basis of available local resources and international experience in this subject area. Secondary priorities to be addressed at a later point in the strategy operational period will include the development of options identified during the initial stages. For the sake of organizational clarity, sustainable uses have been subdivided into three sub-components:

Economic Use: This includes uses such as hunting, tourism, non-timber products, etc., upon which fairly exact economic values can be assigned but in addition covers aspects such as water catchment protection and desertification prevention, which are more difficult to value monetarily but which have clear economic importance to the Republic. An extremely important point, in the context of the growing poverty in rural areas, is that sustainable use must be carried out by people at the grassroots if it is to succeed. If they are to be committed to such use they must derive direct benefits from it

Scientific and Educational Use: This component includes use of natural areas as "living laboratories" for scientific research which forms the basis for improved understanding, conservation and use of biodiversity resources. In addition, natural areas are the basic resource for ecological education.

Cultural and Recreational Use: Uzbekistan is a new nation with an emerging sense of its cultural and historical heritage - the nature and landscape of Uzbekistan are an integral part of that heritage, representative components of which must be conserved. Secondly, Uzbekistan is a country with a rapidly growing and youthful population with increasing recreational needs. The availability of natural areas will be important in meeting these needs.

#### 4. Justification for Strategic Priorities

The above important areas have been identified as the three essential issues for Uzbekistan to address at this time for it to meet its sustainable development needs in this sector. Actions under this strategy will allow for meeting priority issues, such as:

- \* the creation of an effective and sustainable protected areas system which is targeted at achieving representative biodiversity conservation and protection of environmental quality;
- \* increased awareness and education on biodiversity; issues at all levels to ensure support, commitment and participation to actions;
- \* evaluation, assessment and development of sustainable use of biodiversity and equitable sharing of benefits.

**Protected areas development** has been identified as the area of **first priority** because of the need for immediate actions to reduce rapid loss of biodiversity, to address urgent problems facing protected areas management and to take advantage of the current momentum for reform in Uzbekistan.

**Public awareness, education and participation** have been allocated second highest priority mainly because it is recognized that achievements in these areas will require time. However, they are vital components for the strategies long term success.

**Sustainable use** has been allocated third priority for two reasons: firstly, a number of issues / actions relevant to sustainable use will form components of protected areas development and public awareness,

education and participation. Secondly, utilization of the full potential of biological resources is a comparatively new concept in Uzbekistan, as elsewhere, and one which will initially require some evaluation and assessment before concrete action is undertaken.

## Strategy Approval, Operational Period and Implementation

### 1. Strategy Approval

Approval of the strategy will be provided by the Cabinet of Ministers of the Republic of Uzbekistan, following review and clearance by the National Biodiversity Project Steering Committee. At this time it will become the official policy of the Republic of Uzbekistan and, in accordance with its obligations under the International Convention on Biodiversity, a report will be issued to the Conference of Parties.

### 2. Operational period

The strategy will be implemented on the basis of a 10 year operational period (1998 to 2008). A review of the strategy and its implementation will be undertaken after 5 years (2002).

### 3. Implementation

The strategy will be implemented on the basis of the objectives and outputs indicated below and detailed in the Action Plan. The Action Plan includes details of concrete actions, responsibilities, and timetable.

### 4. Implementation Responsibility

The Deputy Prime Minister, responsible for the environment, will hold overall responsibility for the implementation of the strategy, which will form an independent component of the Action Plan for Nature Protection and Ecological Provisions for Sustainable Development of the Republic of Uzbekistan which is currently being developed.

The National Commission for Biodiversity (NCB) will be directly responsible for the implementation of the Action Plan, monitoring and review of the strategy implementation and for reporting of the implementation progress to the Conference of Parties. The commission will also be responsible for ensuring that review and possibly revision of the strategy and action plan is carried out on a minimum 5 yearly basis. The commission will be based on the current Biodiversity Strategy Project Steering Committee and its membership will reflect all the major stakeholders, including institutions controlling the use and protection of biological resources, production sector institutions which are responsible for exploitation or have direct impact on biological resources, planning and finance sectors and representative environmental NGO leaders. Following the establishment of the National Sustainable Development Commission the NCB will collaborate with it.

Responsibility for concrete actions indicated in the Action Plan will rest with the institution or agencies designated by the Government on the basis of recommendations provided the Action Plan.

## Strategy Goal, Objectives and Outputs

### 1. Goal

*Through conservation and sustainable use, to protect and maintain Uzbekistan's biodiversity as a critical component for its sustainable development, for the benefit of all people of Uzbekistan, both present and future.*

### 2. Objectives and Outputs

### ***Objective 1: Protected Areas System***

**“To establish a system of protected areas with strong legal protection and effective management which is properly representative of the range of Uzbekistan’s ecosystems and species, and which covers at least 10% of the country.”**

#### Institutional and Legal Provisions

- I. Review of the suitability and adequacy of existing institutional arrangements for administration and management of protected areas, and any changes if required.
- II. Review of the legal provisions for protected areas, including the adequacy of various types of protected area status, and any changes if required.

#### Protected Area Management

- I. Review of the adequacy of staffing, funding and equipment levels for protected area management, and any changes if required, on the basis of current experience and in accordance with the reorganized / expanded protected areas system.
- II. Improved recruitment and training procedures for protected areas staff.

#### Protected Areas System Reorganization and Expansion

- I. Based on available data, develop maps showing national ecosystems, the location of key biodiversity areas and habitats and current status.
- II. Review categories of protected areas and initiate revision/reform to best meet the current needs of Uzbekistan (see legal review above).
- III. Through an expert consultative process, identify gaps and needs and reach agreement on selection criteria.
- IV. Selection of proposed protected areas in terms of agreed criteria.
- V. Appropriate consultation procedures at all levels.
- VI. Complete procedures for establishment of protected areas.

#### Biodiversity Information System

- I. Develop an appropriate system for storage and processing of relevant biological resources information, which is applicable to effective decision making.
- II. Ensure knowledge of and full access to the information system by decision makers and other interested parties.

### ***Objective 2: Public Awareness, Participation and Education***

**“Achieve at all levels an adequate understanding and appreciation of the full value of biodiversity to Uzbekistan’s sustainable development and support for the efforts to adequately conserve and the Republic’ biological resources.”**

#### Increased Knowledge Base of Decision Makers

- I. Develop information packages and guidelines for decision makers from different sectors, particularly agriculture, production forestry and water management, on biodiversity conservation and sustainable use. Provide easily accessible and utilisable information on biodiversity issues to decision makers from all sectors.
- II. Ensure a multi-sectorial representation on national, regional and local biodiversity committees, associations and relevant organizations.

#### Increased Public Awareness

- I. Develop a media program (print, radio, television) designed to convey a broad understanding of the full value of biodiversity to Uzbekistan’s sustainable development
- II. Gain public support for major biodiversity conservation and sustainable use activities, particularly protected areas, via full dissemination of information at national and local level.
- III. Develop local and community biodiversity awareness programs for areas of particularly high value / importance to biodiversity conservation and sustainable use.

## Education

- I. Through an expert consultative group, fully identify gaps and problems with current schools and higher education curriculum's and approaches.
- II. Identify other ongoing activities and initiatives in the field of environmental education
- III. Identify priority actions required and develop a national biodiversity education plan.
- IV. Implement procedures for establishment of biodiversity education in the national education system.

## Public Participation

- I. Establishment of biodiversity conservation and sustainable use support / interest groups and associations at national and local level.
- II. Identify and develop means and mechanisms for encouraging public participation in biodiversity conservation and sustainable use, particularly by local level support groups and communities around or within protected areas.

### ***Objective 3: Sustainable Use of Biodiversity***

**“Via the controlled use of biodiversity resources, achieve the maximum economic, scientific, recreational and cultural benefits for all the people of Uzbekistan, while at the same time ensuring the long term conservation of biodiversity and viability of ecosystems.”**

#### Sustainable Economic Use

- I. Develop within the protected areas system methods and mechanisms for achieving the sustainable utilization while at the same time ensuring adequate biodiversity conservation.
- II. Through an expert consultative group, identify and review the current economic use and regulation of biodiversity resources in Uzbekistan and the adequacy of current regulatory mechanisms.
- III. Identify potential new means and mechanisms for sustainable utilizing Uzbekistan's biodiversity resources and the equitable sharing of benefits, particularly to rural communities.
- IV. Identify priority areas requiring increased research, regulation or development
- V. Make recommendations on future development of the sustainable economic use of biodiversity resources in Uzbekistan including principle mechanisms, revision or strengthening of regulatory systems and institutional responsibilities.

#### Scientific and Educational Use

- I. Through an expert consultative group, review the current scientific and educational use of biodiversity, particularly within protected areas, identify principle problems and limitations, and make recommendations for maximizing benefits of such use.
- II. Establish an expert scientific group to assess the importance of agro-biodiversity in Uzbekistan and on this basis develop a program for its conservation and use.
- III. Establish an expert scientific group to assess the status of bio-technology and bio-pharmaceutical development in Uzbekistan and make recommendations concerning their further development.

#### Cultural and Recreational Use

- I. Identify the current and future recreational needs of Uzbekistan and role protected areas and other areas of biodiversity and landscape value will play in meeting those needs.
- II. Assess the implications for biodiversity of current and future recreational needs and identify methods and mechanisms for maximizing benefits while minimizing impacts.
- III. Identify ecosystems and species' of particular cultural significance and develop approaches that conserve features important to the national cultural heritage.

### ***Objective 4: Regional and Local Level Biodiversity Action Plans***

**“Within the framework of the National Biodiversity Strategy and Action Plan, carry out the creation of regional (Karakalpakstan) or local (Oblast or rayon level) action plans which more specifically meet regional / local requirements and issues.”**

- I. Form the required organizational structure by regional / local authorities, scientists, NGO's and interest groups (steering committee, preparation team).
- II. Prepare assessment of biodiversity situation in area including: analysis of biodiversity importance, problems and required actions.
- III. On the basis of the assessment prepare realistic regional / local action plan, indicating the actions to be taken, responsible institutions / organizations, approximate financing and timetable.

## **Part 3. National Action Plan for Biodiversity Conservation**

### **Organizational Structures, Responsibilities and Overall Time Frame**

The strategy will be implemented on the basis of the National Biodiversity Action Plan detailed below. The Action Plan derives directly from the strategy outlined above but provides in details the actions, responsibilities, and timetable for concrete actions necessary to implement the strategy. The action plan covers the full ten years of the strategy period but must be updated after the first 5 year period.

### **Strategy and Action Plan Implementation Organizations**

#### **National Commission for Biodiversity (NCB)**

Overall responsibility for initiating, monitoring and reviewing the strategy and action plan implementation will rest with the National Commission for Biodiversity (NCB), which will be established through a governmental decree on the basis of recommendations of the National Biodiversity Strategy Project Steering Committee and whose membership will be, by and large, inherited from this committee. The Academy of Sciences will remain the main organisation responsible for consulting: research, and monitoring.

The National Commission for Biodiversity will act in compliance with its mandate subject to approval of the Cabinet of Ministries. The Commission will meet on a regular basis every 3 months to consider programmes prepared and submitted in accordance with the Action Plan and take appropriate decisions / action for their Implementation

Additionally, the Commission will meet on an annual basis to receive a progress report and review the action plan implementation. After five years a full scale assessment of the Action Plan implementation will be carried out and, on the basis of achievements, experience and changing circumstances, a rescheduling / revision of the following 5 years will be carried out. During the final (9th) year of the Strategy period the Commission will initiate action to prepare a new Biodiversity Strategy and Action Plan to cover the following ten year period (i.e. period 2008 to 2018).

#### **Action Plan Coordination Group (APCG)**

The first priority of the National Commission for Biodiversity will be to instigate the establishment of an Action Plan Co-ordination Group (APCG) which will be formed within the State Biological Control Unit (Gosbiocontrol) in the State Committee for Nature Protection. The APCG will have three sets of responsibilities:

- 1 Firstly, it will act as a central focal point for all organisations involved in the Action Plan implementation and will be responsible for initiating actions detailed in the Action Plan (i.e. establishing expert groups. etc.) and co-ordination of different activities to ensure unity of purpose and effort
- 1 Secondly, the APCG will be responsible for collating reports and proposed projects/programmes generated by the Biodiversity Action Plan, and for ensuring that either concrete actions are taken directly or that they are submitted to the 3 monthly meetings of the National Biodiversity Commission for higher level clearance and action
- 1 Thirdly, the APCG will be responsible for preparing the annual progress reports to the National Biodiversity Commission concerning the implementation of the Action Plan and will be

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responsible after 5 years for organising the review and revision of the Action Plan.

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BIODIVERSITY ACTION PLAN IMPLEMENTATION  
ORGANISATIONAL CHART

DEPUTY PRIME MINISTER RESPONSIBLE FOR ENVIRONMENT

NATIONAL COMMISSION FOR BIODIVERSITY (NCB)

ACTION PLAN COORDINATION GROUP (APCG)

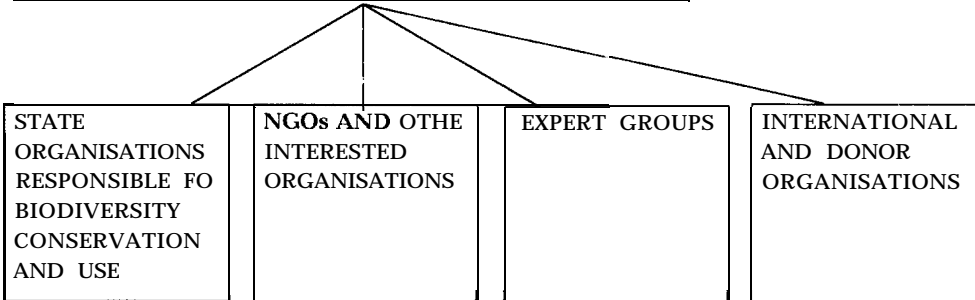




Table BB: Timetable of the Strategy and Action Plan Implementation Activities

	Each 3 months	Annually	After 5 years	10th year
NCB meetings to consider reports and proposals submitted by APCG				
NCB to review Action Plan progress on basis of report submitted by APCG				
NCB to initiate review and update/revision of Action Plan				
NCR to initiate the preparation of Strategy and Action Plan for following 10 year period (2008-2018)				

### Organizational Steps Prior to Action Plan Commencement (January 1998)

For the implementation of the Action Plan to start in a timely manner in January 1998 the following steps are required to establish the organisational basis for the Strategy and Action Plan. These are:

- the National Biodiversity Strategy and Action Plan Project Steering Committee must meet and agree the membership of the National Commission for Biodiversity and carry out the necessary procedure for its official recognition:
- the National Commission for Biodiversity must take the necessary decisions to establish the Action Plan Co-ordination Group within the State Biological Control Unit, including the allocation of the necessary personnel, office space, equipment and budgetary allocation.
- the State Biological Control Unit must take the appropriate action to ensure the APCG is ready to undertake its responsibilities by the 1st January 1998.

### Action Plan: Goals, Steps, and Outputs

Introduction: The Action Plan consists of 5 sections: (1) Protected Area System; (2) Public Awareness, Participation, and Education; (3) Sustainable Use of Biodiversity Resources; (4) Regional and Local-level Biodiversity Action Plans; (5) Co-ordination of International Relations and Aid in the Field of biodiversity.

Every section contains subsections that list actions taking which are required for meeting the objectives of the section.

An action description contains the entry putting down organisational context and responsibilities (e. g. 'APCG forms an expert group'), the entry(s) showing steps to reach the desired result, and, finally, the conclusive entry designating the result. For the sake of clarity different-type entries are marked with distinct symbols, as follows:

- \* indicates organisational structure
- ⇒ indicates steps required
- Indicates output.

## *1. The System of Protected Areas*

***Overall Objective: To establish a sustainable and diversified system of protected areas with strong legal protection and effective management which is properly representative of the range of Uzbekistan's ecosystems and species and which covers at least 10% of the country.***

### **1.1. The Institutional and Legal Provisions**

***Section 1.1 Objective: To develop the institutional and legal basis for development and management of an expanded and reorganized protected areas system***

1.1.1 Review existing institutional arrangements for administration and management of protected areas and an introduction of changes to ensure their adequacy.

- \* A specially established group (commission) of independent experts (specialists from Academy of Sciences, the Ministry of Justice and NGO's) will:
  - ⇒ review the existing institutional arrangements for the management of protected areas: identify priority problems and changes required to meet the new approach developed below (see 1.2)
  - ⇒ on the basis of the above, the commission will prepare recommendations concerning reforms required to the existing distribution of institutional responsibility for administration of different categories of protected areas (i.e. which institution will have responsibility for strict nature reserves, which for national parks and which for other areas, etc.)
- ◆ **submit recommendations to the National Commission for Biodiversity (NCB) for clearance and forwarding to Government of the Republic of Uzbekistan**

1.1.2. Review of the legislation on protected areas

- \* To establish a group of experts to analyse the existing legislation on protected areas, which will:
  - ⇒ analyse the existing legislation, and determine its completeness and adequacy in the context of its reorganisation and reform
- ◆ **prepare the relevant proposals for making changes in or additions to the legislation and submit it to the Government of the Republic of Uzbekistan for approval.**

### **1.2. Protected Areas System Reorganization and Expansion**

***Section 1.2 Objective: to develop a program to create a reorganized and expanded protected areas system which best meets the biodiversity conservation and development needs of the country under the new political and socio economic conditions.***

1.2.1. Develop and formalize a new conceptual approach to protected areas design and management which will best meet the biodiversity conservation and development needs of the country under the new political and socio economic conditions.

- \* To organise a independent group of experts to develop recommendations on the general objectives

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and methodological approach of the national protected areas system. This group will:

⇒ analyse the current objectives and methodological approach of the protected areas system in Uzbekistan and examine international experience in this field

⇒ develop the conceptual basis for a new protected areas system and its role in the natural resources management policy of the country, taking into account Uzbekistan's specific environmental and socio-economic situation and known international "best practices".

- ◆ submit a report to Action Plan Co-ordination Group (APCG)

### 1.2.2 Protected Areas Categories and Selection Criteria

- \* establish a group of experts to determine, in the context of the above report, new categories of protected areas and selection criteria for their establishment

⇒ review international norms, recent experience in other CIS countries and the existing situation in Uzbekistan

- ◆ submit recommendations for required categories of protected areas **in Uzbekistan, and criteria for their selection and establishment to the APCG**

### 1.2.3 Ecological and Land Use Mapping for National Protected Areas Planning:

- \* Establish a group of independent experts including biologists, geographers, specialists in landscape science, cartographers and foresters to prepare basic maps including

⇒ large scale maps of existing network of protected areas

⇒ maps of ecological systems of country indicated areas requiring priority protection

⇒ maps showing current land use and indicating areas potentially available for use as protected areas

- ◆ submit maps and data to APCG

### 1.2.4. Development of a National Ecological Network Program(protected areas of various categories/status), its approval and realization.

- \* The Action Plan Co-ordination Group, on the basis of reports and criteria submitted by expert groups, will:

identify existing areas which require reorganisation / changing of category (status).

identify the areas with potential for expansion of current protected areas, and creation of new protected areas

consult with current land users of areas identified and local governments to ensure practical conditions exist for expansion of existing areas / creation of new areas.

prepare plan of action for realisation of National Ecological Network Programme , detailing recommended expansion / reorganisation of existing areas and creation of new areas

- ◆ **submit proposed programme to the National Commission for Biodiversity (NCB) for passing to the Government for clearance**

1.2.5 Implementation of plan of action for realizing the National Program of Ecological Network

- \* APCG to ensure appropriate measures are taken for the realisation of the National Ecological Network of protected areas.

### **1.3 Management of Protected Areas**

***Section 1.3 Objective: To identify the changes required in order to effectively manage the reorganized and expanded protected areas system developed under section 1.2 and develop a program to carry out necessary changes***

#### 1.3.1 Protected Areas Management Structure

- \* Establish a group of experts from the institutions responsible for management of protected areas which will:
  - ⇒ Assess current management structure of protected areas system, and on the basis of international and local experience identify changes in management structure required for effective management of reorganised protected areas system., at both protected areas level and central administration levels.
  - ⇒ Identify mechanisms for ensuring effective co-ordination and co-operation between national institutions responsible for management of protected areas within the republic and also those of bordering countries
  - ⇒ Identify mechanisms for ensuring practical involvement of local government and other local level organisations including NGO's and community groups, in management of protected areas.
- ◆ **Submit to APCG a report outlining necessary changes to current management structures required and co-ordination /co-operation measures needed.**

1.3.2. Protected Areas Personnel: Assessment of personnel expertise and sufficiency of numbers to implement the reorganized protected areas system and recommendations for action.

- \* A group of experts from institutions responsible for management of protected areas shall :
  - ⇒ identify the gaps between existing technical knowledge/expertise of protected areas managers/staff and those required to implement the reorganisation of the protected areas management
  - ⇒ develop a national programme for addressing gaps in protected areas personnel technical knowledge and expertise including: the development of national and local facilities for training / retraining of managerial and field staff of protected areas; and .utilisation of international

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experience through study tours/overseas training

⇒ identify potential sources of international technical and training support (training facilities and financing of training)

⇒ work out optimal and sufficient number of employees for protected areas of various status in the context of reorganised protected areas system

- ◆ **submit a report to APCG detailing needs in terms of protected areas personnel training and numbers and recommended actions.**

### 1.3.3. Scientific Research and Monitoring for Protected Areas Management

\* An expert group including members of institutions involved in protected areas management, protected areas field staff and Academy of Science will:

⇒ identify the basic research required within protected areas of different category / status for monitoring and decision making purposes

⇒ design standard research and monitoring programmes for each category of protected area

- ◆ **submit proposed standard research and monitoring programmes to APCG for review and action.**

1.3.4. Determination of the levels of existing equipment and supplies for protected areas management and identify needs in the context of the reorganized protected areas system.

\* The group of experts from institutions responsible for management shall :

⇒ carry out an analysis of the current levels of technical equipment and supplies for the protected areas :

⇒ identify the standard equipment and supplies that will in the future be required by protected areas of different category / status within the reorganised system

- ◆ **submit proposals to the APCG for introduction of changes into the level of technical equipment and supplies provided to protected areas of different category / status**

1.3.5. Determination of financial resources required for development of reorganized protected areas system. and identify sources for these financial resources

\* A group of independent experts shall consider the level of budgetary financing required for the reorganised protected areas system for the initial 5 years of the action plan implementation and

⇒ calculate budget estimates for both development requirements in protected areas and annual recurrent costs based on the reports submitted (actions 1.3.1, 1.3.2, 1.3.3).

⇒ identify sources of financing for development and annual recurrent costs (i.e. state sources, funds generated by protected areas, international sources for specific developments)

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### ◆ submit report to APCG for consideration and action

1.3.6. Development and adoption of a single program of management of protected areas at the governmental level

\* The APCG together with institutions directly involved in management and other interested parties which will:

⇒ review reports made above ( 1.3.1 - Management Structure, 1.3.2- Personnel Training and Numbers, 1.3.3- Equipment and Supplies. 1.3.4 - Financing)

⇒ on the basis of the above reports work out a single national programme of management of protected areas

### ◆ submit the mentioned programme to the NBC for consideration, examination by independent experts and its further approval at the highest level of the Government of the Republic of Uzbekistan

1.3.7. Implementation of an approved unified program for protected area management

\* APCG along with other stakeholders in protected area management will:

⇒ prepare specific action plan to implement programme for management of the reorganised protected area system

⇒ ensure adequate level of financing from state budget and other sources

### ◆ implement the action plan of the programme for management of the reorganised protected area system

## 1.4. National Biodiversity Information System

*Section 1.4 Objective: To establish a centralized information data base on biodiversity which is accessible to all interested parties and which provides data of practical usefulness for decision makers and planners*

1.4.1. To develop and approve an appropriate information system for storage and processing of relevant biological resource information applicable for effective decision making

\* The Action Plan Co-ordination Group with the assistance of experts in this field will:

⇒ establish a central information centre for biological resources and its management including a library of appropriate documents and data including a computerise data base using IDRISI Geographical Information System (GIS)\*

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\* IDRISI software and appropriate PC already available from GEF National Strategy Project

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⇒ train appropriate staff in the development and use of information centre, particularly GIS.

- ◆ **ensure that officials responsible for decision-making and other interested parties are given unlimited access to information**

### 1.5. Captive Breeding and Ex-Situ Conservation

*Section 1.5 Objective: preservation and multiplication of rare and endangered species of Uzbekistan and Central Asian biodiversity for re-release to natural conditions, for scientific research applicable to their future conservation or sustainable use, and for educational purposes*

1.5.1. Captive Breeding: Build upon existing experience in captive breeding through further development within special sites and protected areas of captive breeding programs for seriously endangered species considered important in achieving the overall conservation needs of the Republic.

- \* Establish an expert group which will:
  - ⇒ identify species requiring special efforts to ensure their survival and assess the practicality / value of these species for captive breeding
  - ⇒ review existing captive breeding experience and capacity in Uzbekistan and identify potential international technical and financial support
  - ⇒ identify sites for breeding and sites for reintroduction of breed species
- ◆ **develop a captive breeding programme for priority species and submit to NCB for consideration**

#### 1.5.2. Zoological and Botanic Gardens

- \* Establish an expert group which will:
  - ⇒ assess the current objectives and activities of zoological and botanic gardens in the country and their value for biodiversity conservation and awareness
  - ⇒ assess international experience in this field and identify sources of potential technical and financial support
  - ⇒ develop a programme for zoological and botanic garden development and management which places emphasis on ensuring such facilities meet the biodiversity conservation, scientific research and public awareness/education needs of Uzbekistan.
- ◆ **Submit the above programme to the NCB for consideration and further action by the Government of Uzbekistan.**

### 2. Public Awareness, Education and Participation

*Section Objective: Achieve at all levels an adequate understanding and appreciation of the full value of biodiversity to Uzbekistan's sustainable development and support for the efforts to adequately conserve the Republic's biological resources.*

#### 2.1. Strengthening of Awareness and Information Base of Officials Responsible for Decision-Making

*Section 2.1 Objective: To ensure that decision makers in government have a sound basic knowledge of the role biodiversity plays in sustainable development and an awareness of*

*how biodiversity issues and legislation effect their sectors of responsibility.*

2.1.1. To work out biodiversity information packages and guidelines on “best practices” for government bodies and public organizations, particularly for those working in the production sectors utilizing natural resources

- \* An expert group, including specialists from protection and production sectors shall:
  - ⇒ develop brief informational packages for decision makers of different sectors covering :relevant nature protection legislation; basic information on ecological processes; the concept of sustainable development; biodiversity and its importance in economy; examples of international experiences in this field.
- ◆ **submit to NCB for consideration, approval, and publication and distribution to relevant government organisations, specialist training institutions and other appropriate locations.**
  - ⇒ identify government / public organisations having the greatest negative impact on biodiversity and which specific activities have the most impact
  - ⇒ identify realistic practice and controls that can be introduced by the above government / public organisations to mmimise their negative impacts on biodiversity
  - ⇒ develop information packages and “best practice” guidelines for the decision makers of specific production sectors
  - ⇒ submit to NCB for consideration and approval
- ◆ **publication and distribution to relevant government organisations , specialist training institutes and other appropriate locations**
  - ⇒ assess current Environmental Impact Assessment (EIA) procedures for development projects in Uzbekistan in terms of biodiversity controls / measures
  - ⇒ identify additional measures and proccdures for EIA’s to ensure their adequate representation and valuation of biodiversity factors and issues
- ◆ **submit report to NCB for consideration and further appropriate action.**

2.1.2. Provide easily accessible and utilisable information on biodiversity issues to decision makers from all sectors

- ◆ **APCG to establish an effective system for dissemination information generated / stored in Biodiversity Information Centre (see Section 1.4: Biodiversity Information System)**

*2.2. Increase in the Level of Public’s Awareness*

*Section 2.2 Objective: To increase the overall awareness and understanding of the citizens of Uzbekistan on sustainable development and the role/value of biodiversity*



2.2.1. To develop a national program of mass media (press, radio and TV) for a wide demonstration of biodiversity and its role in the sustainable development of Uzbekistan.

\* The group of experts and consultants shall:

- ⇒ analyse the experience of domestic and foreign mass media in covering the problems of biodiversity conservation and sustainable use
- ⇒ identify critical information
- ⇒ work out and introduce into the system of state telecasting and broadcasting regular telecasts and broadcasts of scientific, popular-scientific and debatable character on the problems of biodiversity in the context of sustainable development, which **will** be tailored to the wide audience of various age groups and backgrounds
- ⇒ work out and introduce into the main state editions the mechanism of biodiversity problems coverage in the context of the sustainable development of Uzbekistan
- ⇒ work out a system of encouragement of television companies and periodical press including commercial ones for a propaganda of biodiversity issues
- ⇒ to develop informational packages for press or broadcast which serve as a supplement to educational curriculum's in schools and higher education institutions
- ⇒ to organise at both national and Oblast levels the adoption of a symbol for the biodiversity awareness campaign and the designation of an annual "biodiversity" day

- **submit proposed national programme to NCB for consideration and appropriate action.**

2.2.2. Gain public support for major biodiversity conservation and sustainable use activities prior and during their implementation via the full dissemination of information to the general public and local authorities and communities effected.

\* The APCG together with other relevant institutions will:

- ⇒ develop standard procedures for ensuring that prior to all major biodiversity activities and developments, information is disseminated to the general public and particularly local authorities/ local communities effected by the development / activities
- ⇒ develop standard procedures for ensuring consultation and participation of local authorities and communities during planning of developments / activities
- ⇒ develop standard procedures for providing periodic information on developments/ activities during implementation to general public and particularly local authorities / local communities effected

- ◆ **carry out review of procedures developed and adopt them as standard procedures for future biodiversity development/activities planning and implementation.**

2.2.3. To develop guidelines and a framework for creation of specific local and

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community biodiversity awareness programs for areas of particular high value / importance to biodiversity conservation and sustainable use

- \* A group of experts will be established to:
  - ⇒ review the wide international experience in the development of wildlife conservation awareness and education programmes in or around protected areas and other areas of high biodiversity value
  - ⇒ on basis of the above and the prevailing conditions in Uzbekistan, identify the critical information that needs to be conveyed, who it should be conveyed to (i. e. local authorities or civil organisations or rural communities /individuals) and what approaches to use for each level
  - ⇒ identify critical local government authorities to be targeted and to be involved in biodiversity awareness building in or around protected areas/areas of high value to biodiversity conservation
  - ⇒ identify civil organisations and groups that can be used to effectively build local communities awareness and support for actions to preserve and sustainable use biodiversity, including farmer and hunting associations , mahallahs, religious and traditional leaders. schools, local NGO's, etc.
  - ⇒ develop the concept / methodology for the creation of biodiversity education scientific research and visitor awareness centres in/around protected areas and other high value areas
  - ⇒ on the basis of the above. prepare guidelines for development of biodiversity local awareness and education programmes in/around protected areas and other areas of high biodiversity value
- ◆ **submit guidelines to APCG for review and distribution to authorities responsible for Oblast level biodiversity action plan development (see section 4. Regional and Local Action Plans), relevant local civil organisations and protected areas managers.**

### 2.3. Education

***Section 2.3 Objective: To develop an education system which provides new generations of citizens with a sound basis of environmental understanding and knowledge and an awareness of the importance of biodiversity for Uzbekistan's sustainable development.***

2.3.1. Identify other ongoing activities and initiatives in the field of environmental education

- \* The APCG will organise a specialist group to:
  - ⇒ carry out a review of ongoing or planned projects/programmes/ activities in Uzbekistan, Central Asia or CIS which have direct relevance, overlap or relevance for biodiversity education and awareness in Uzbekistan (TACIS Environmental Awareness Programme for NIS, Environmental Action Plan, Western Tien Shan Transboundary Project etc.).
  - ⇒ prepare a catalogue of such projects and their areas of relevance to the biodiversity action

Plan

- ◆ **initiate discussion with projects/programmes/activities implementers and define co-operation, integration and co-ordination of activities.**

2.3.2. To organize a group of experts and consultants for revealing the gaps and problems in higher, secondary and specialized secondary education.

- \* The group of experts shall carry out an assessment which will:
  - ⇒ review international experience and practices in terms of environmental and biodiversity education
  - ⇒ define the critical objectives and results the overall education system in Uzbekistan should achieve in terms of environmental and biodiversity education
  - ⇒ assess current ecological and biodiversity education throughout the education system
  - ⇒ in context of the above, identify problems with the current system in terms of its current objectives, legal framework, curriculum, text books, teaching methodology, and teacher training.

- ◆ **prepare a report of the above assessment and submit it to NCB**

2.3.3. To identify the necessary actions and develop a national educational program on biodiversity preservation.

- \* The group of experts, on the basis of the report prepared above (section 2.3.2), shall:
  - ⇒ define the specific actions required to address the problems identified above in order to achieve an educational system which meets future needs of Uzbekistan in terms of environmental and biodiversity education
  - ⇒ identify which areas of action are or will be addressed by other ongoing or planned projects/programmes/activities
  - ⇒ design a programme of environmental and biodiversity education for all levels of the education system which fills the gaps left by other ongoing or planned projects/programmes/activities

- ◆ **submit proposed programme to NCB for consideration and further action.**

2.3.4. Implement the Program of Education on Biodiversity Conservation Issues

- \* APCG along with other relevant organisation shall:
  - ⇒ develop a detailed action plan for the programme implementation
  - ⇒ identify expenses and sources of their covering

- ◆ **implement the Programme of Education on Biodiversity Conservation Issues**

## 2.4. Public Participation

***Section 2.4 Objective: To increase the practical involvement of the public, particularly national/local NGO's and rural communities living in areas of biodiversity importance, in planning, decision making and implementation of activities to conserve and sustainably utilizing biodiversity resources***

2.4.1. NGO and “Environmental Information” Legislation

- \* Establish an expert group, including members of State Committee for Nature Protection, legal experts and NGO's to:
  - ⇒ identify planned or ongoing projects/programmes/activities addressing the issue of access to environmental information to the public
  - ⇒ identify current legislation concerning “free or open” access to biodiversity information and assess problems related to its actual use
  - ⇒ in the context of other planned or ongoing projects/programmes/activities identify any further actions required to improve public access to biodiversity information
- ◆ **submit recommendations to APCG for consideration / appropriate action**
  - ⇒ identify planned ongoing projects/programmes/activities addressing legislative problems connected to NGO establishment and operation
  - ⇒ identify any additional action to support the above
- ◆ **report recommendations to APCG**

2.4.2. Public Participation in Planning and Management of Protected areas

- \* A group with members from APCG, protected areas managers and NGO's will:
  - ⇒ review international mechanisms and approaches for achieving public participation in protected areas planning and management
  - ⇒ identify areas of protected areas management NGO's, local community groups and other local groups can contribute the most.
  - ⇒ identify practical lessons learnt by ongoing projects in regard to building public participation
  - ⇒ assess adequacy of recommendations made under Section 1.3.1, Step 3, Section 2.2.2 and Section 2.2.3, concerning practical involvement of local governments, and other local level organisations including NGO's and community groups in management of protected areas.
- ◆ On basis of above make recommendations regarding improvement of public participation in protected areas and submit to APCG.

2.4.3. Local Biodiversity and Protected Areas Support Groups / Associations.

- \* APCG together with protected areas managers and NGO representatives to:
  - ⇒ review work carried out under Section 2.2.3 , other relevant section reports prepared under this

action plan and the experience of relevant ongoing projects/programmes/activities

- ◆ **prepare guidelines for creation of local level biodiversity and protected areas support groups and disseminate to regional /Oblast biodiversity action planning teams, protected areas managers, local NGO's.**

### ***3. Sustainable Use of Biodiversity Resources***

Overall Objective: Via the controlled use of biodiversity resources, achieve the maximum economic, scientific, recreational and cultural benefits for all the people of Uzbekistan, while at the same time ensuring the long term conservation of biodiversity and viability of ecosystems.

#### **3.1. Sustainable Use for Economic Purposes**

***Section 3.1 Objective: To establish a framework for the optimal sustainable use of biodiversity resources and the equitable sharing of benefits***

3.1.1. Development of Sustainable Use Mechanisms within Protected Areas System: In the framework of the system of protected areas to work out and test methods and mechanisms of achieving sustainable use of biological resources while ensuring adequate biodiversity preservation

\* The group of independent experts from the Academy of Sciences, the Ministry of Macroeconomics, the State Committee for Nature, the State Committee for Forestry and others shall:

- ⇒ take the international practice as an example and study the opportunity for sustainable use of biological resources within in the system of protected areas
- ⇒ assess the experience and lessons learnt by ongoing projects in this field (i.e. Western Tien Shan transboundary Project ).
- ⇒ study the opportunity for adaptation of these forms of sustainable use employed to contemporary conditions of Uzbekistan
- ⇒ work out mechanisms of social interests of and economic incentives for local population living in the regions adjoining or within protected areas
- ⇒ consider the problems and work out a system of balanced existence of protected areas and local population
- ⇒ develop a programme of use and maintenance of biodiversity in selected protected areas of various category/status which will provide testing sites and models for the overall protected areas system and other rural areas.

- ◆ **submit programme to the NCB for consideration and high level adoption by the government.**

3.1.2. Assessment of Current Economic Use of Biological Resources in Uzbekistan: Identify and review the current economic use and regulation of biological resources in

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Uzbekistan and the adequacy of current regulatory mechanisms.

\* The group of experts shall

- ⇒ carry out an analysis of qualitative and quantitative aspects of contemporary use of biological resources and their effectiveness
- ⇒ analyse the international experience in effective use and control of biological resources
- ⇒ assess the sufficiency and effectiveness of contemporary regulating mechanisms, including the adequacy of contributions into restoration of biological resources by users
- ⇒ taking into consideration the international experience, to prepare a package of proposals or normative documents for introduction of changes to current mechanisms used for biological resource use and the existing regulation methods.

1 **submit to the APCG** for consideration and further action.

3.1.3. To determine potential new instruments and mechanisms for sustainable use of biological resources and fair distribution of benefits

\* The group of independent experts shall:

- ⇒ analyse the international experience in sustainable use of biological resources and equitable sharing of benefits.
- ⇒ analyse potential new approaches, instruments and mechanisms for sustainable use of biological resources which can be applicable for Uzbekistan
- ⇒ on the basis of obtained data and taking into account the international experience, work out a package of proposals for introduction of new approaches, instruments and mechanisms for optimisation of biodiversity use and fair distribution of benefits

1 submit proposals to **APCG for further action.**

3.1.4. Identify priority areas requiring increased research or development

\* establish an expert group who in collaboration with committees, ministries, agencies and other concerned organisations using and controlling the use of biological resources, will:

- ⇒ identify biological resources with actual or potential economic value but for which insufficient information is available to adequately assess their real value, availability, sensitivity to use, etc.
- ⇒ develop a research and development programme to address lack of information.
- ⇒ develop a programme for the research, analysis and disseminate of useful traditional knowledge and technologies in the field of rational utilisation of nature from Uzbekistan, Central Asia and elsewhere.

◆ **submit proposed programme to APCG for consideration and action.**

3.1.5. Development and adoption of overall program for optimal sustainable use of biological resources and equitable sharing of benefits

\* The APCG and independent experts shall:

⇒ review reports and proposals submitted by experts groups (sections 3.1.2: “Assessment of Current Economic Use of Biological Resources in Uzbekistan,” 3.1.3 :“Identify potential new Instruments and mechanisms for sustainable USC of biological resources and fair distribution of benefits:” and 3.1.4: “Identify priority areas requiring increased research or development”)

⇒ develop an overall programme for ensuring optimal sustainable use of biological resources in the Republic

◆ **submit to NCB for consideration and for approval and adoption by the Government of Uzbekistan.**

### **3.2. Use for Scientific Research and Educational Purposes**

**Section 3.2 Objective: To maximize the use of intact ecosystem for appropriate scientific research and education purposes**

3.2.1. Assess contemporary use of biodiversity for scientific and educational purposes, especially the use of protected areas, to identify principal problems and restrictions, and to submit recommendations for deriving maximum benefits from such a use.

\* Establish a group of experts, including protected areas managers, Academy of Science and representatives of scientific and educational institutions, which will:

⇒ assess the contemporary use of biodiversity for scientific and ecological educational purposes and evaluate its adequacy

⇒ work out proposals for encouraging and developing protected areas as “living laboratories” for scientific researchers and students. both national and international

⇒ develop the systems of information exchange and links with leading domestic and foreign research centres

⇒ assess research areas which in the future will contribute to sustainable development and rational biodiversity use, and make proposals for encouraging their development

⇒ on basis of above propose a programme for developing of biodiversity for scientific research and education purposes.

◆ **submit proposed programme to NCB for consideration.**

3.2.2. Agricultural Biodiversity: To organize a group of experts to evaluate the significance of agricultural biodiversity and work out a program on its protection and use.

\* The group of experts which will include specialists from Academy of Science, agriculture and

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State Committee for Nature Protection, will:

- ⇒ evaluate agricultural biodiversity, its qualitative and quantitative characteristics, the degree, completeness and intensity of its use in Uzbekistan and international importance.
- ⇒ review international experience and practices concerning agricultural biodiversity.
- ⇒ assess the current and potential benefits derived from the use of agricultural biodiversity in Uzbekistan.
- ⇒ work out a programme on an optimal protection and sustainable use of agricultural biodiversity

- **submit the proposed programme to the NCB for consideration and further action.**

**3.2.3. Biotechnology and Biopharmaceuticals:** To organize a group of experts to evaluate the status of biotechnology and biopharmaceutical development and make recommendations for their development in the future.

\* The group of experts shall:

- ⇒ evaluate the present state of work in the field of biotechnology and biopharmaceuticals
- ⇒ assess the qualitative and quantitative composition of biodiversity used in these branches
- ⇒ evaluate the effectiveness
- ⇒ make recommendations for and work out a programme on development of biotechnology and biopharmaceuticals in order to obtain maximum economic benefits and equitable sharing of benefits

- ◆ **submit programme to NCB for consideration and further action.**

### 3.3. Biodiversity Use for Cultural and Recreational Purposes

***Section 3.3 Objective: To maximize the sustainable benefits of natural ecosystems and landscapes for recreation/tourism purposes and preservation of areas important for national and local cultural heritage***

3.3.1. Assess Recreational Needs: To determine the current and future recreational needs and the role that the protected and other areas valuable in terms of biodiversity and landscape will play in satisfaction of these needs.

\* The group of experts shall:

- ⇒ identify the resources of nature and landscape with value for recreation and tourism in Uzbekistan and prepare a data base including maps of such areas
- ⇒ conduct a sociological survey to reveal the current and future recreational needs of citizens of Uzbekistan and role protected areas and other areas of natural beauty will play in meeting those needs.
- ⇒ assess the current and forecast levels of international visitors to protected areas and other



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areas of natural beauty

⇒ assess the different requirements of local recreational needs and international tourists

- **submit a report to APCG.**

**3.3.2.** To assess the influence of current and future recreational needs on biodiversity and determine the methods and mechanisms of a maximizing benefits and minimizing damage

\* The group of experts shall:

⇒ on the basis of report made above under section 3.3.1, and wide international research<sup>1</sup> and experience, carry out an assessment of the likely impacts of current and future recreational needs on biological and landscape diversity, particularly in protected areas

⇒ identify methods for limiting recreational loads in the areas of special value or high sensitivity to disturbance

⇒ make recommendations concerning types of recreational use and intensity of use that should be allowed in different categories of natural areas and landscapes and protected areas of various categories/status

⇒ work out mechanisms to ensure the local population maximise their benefits from recreational use of their areas and minimise negative impacts both on their livelihoods and environment.

⇒ on the basis of the above. develop a programme and an action plan which will meet the future recreational and tourism needs of Uzbekistan while at the same time minimise the damage inflicted on areas and landscapes of natural beauty and maximise benefits for protected areas / local people.

- ◆ **submit proposed programme to NCB for consideration and further action.**

**3.3.3.** Identify ecological systems, species and landscapes of particular cultural significance and develop approaches that conserve features that are important for national and local cultural heritage

\* The group of experts shall:

⇒ identify ecosystems, species and landscapes important culturally both at a national and local level

⇒ make up a catalogue of these features and prepare maps

⇒ identify sites necessary to include into the protected areas system

⇒ identify means by which culturally important ecosystems, species and landscapes can be utilised to engender support for biodiversity / landscape conservation activities, education activities and public awareness activities.

- ◆ **submit a report to APCG for further action.**

#### 4. Regional and Local Level Biodiversity Action Plans.

*Overall objective: Within the overall framework of the National Biodiversity Strategy and Action Plan, to carry out the creation of regional (Karakalpakstan) or local (Oblast) biodiversity action plans which more specifically meet regional / local requirements and issues*

##### 4.1. Establishing required organizational structure at regional / local level

- \* The regional / local State Committee for Nature Protection office will be responsible for establishment of regional / Oblast Action Plan Preparation Team which will include regional/local authorities from khokimyats and relevant organisations, biological scientists, protected areas managers, and NGO's.

##### 4.2. Biodiversity Assessment: Preparing assessment of biodiversity situation in region/Oblast, including biodiversity status, importance, and actions required.

- \* The Action Plan Preparation Team to sub-divide work required to carry out assessment and designate working groups responsible for preparing materials
  - ⇒ working groups to prepare materials on designated subject

##### ◆ **submit reports to Action Plan Preparation Team.**

##### 4.3. Preparation and Adoption of Regional / Oblast Biodiversity Action Plan: On basis of assessment, and within the framework of the national biodiversity strategy and action plan, to prepare realistic regional / Oblast biodiversity action plans, indicating the actions to be taken, responsible institutions / organizations, approximate financing, and timetable

- ⇒ Action Plan Preparation Teams to identify priority actions to address major problems / issues in region / Oblast
- ⇒ prepare draft action plan and ensure review and discussion on its contents particularly with major stakeholders such as protected areas managers, rural communities, local natural resources managers (agriculture, water, forestry).
- ⇒ on basis of review and comments received finalise regional /Oblast action plan

##### ◆ **Submit for clearance and adoption to regional / Oblast highest authority.**

#### 5. Biodiversity International Affairs and Aid Coordination

*Overall Objective: To establish an organizational structure for processing and managing matters concerned with international and regional biodiversity legislation and agreements (conventions on Biodiversity, Ramsar, CITES, et al) and identification, realization and coordination of donor support to implementation of the Uzbekistan Biodiversity Action Plan.*

##### 5.1. Establishment of International Biodiversity Affairs Unit

- ◆ **APCG to organise the establishment of International Biodiversity Affairs (IBA) Unit and allocation of appropriate staff and office space.**

### 5.2. International Legislation and Agreements (Conventions)

\* IBA Unit:

- ⇒ to gather all relevant information on international legislation and agreements
- ⇒ assess current international legislation effecting Uzbekistan, agreements to which Uzbekistan is member and agreements that Uzbekistan should be members of.
- ⇒ make a report of the implications and obligations of international legislation and agreements which Uzbekistan is a member of and international agreements that Uzbekistan could benefit from joining.

- **prepare a proposed plan of action on the above and submit to NCB.**

### 5.3. Donor Support and Coordination for Biodiversity Strategy and Action Plan

\* The IBA Unit will:

- ⇒ identify current donors to biodiversity conservation and related sectors in Uzbekistan and Central Asia
- ⇒ identify other potential donors for support to the Biodiversity Strategy and Action Plan.
- ⇒ initiate contact and dialogue with potential donors and identify interest/definite support for different sectors of the Action Plan
- ⇒ facilitate contact between national institutions / organisations and potential or actual donors during finalisation of agreements, project proposals; etc.
- ⇒ prepare records and co-ordinate all donor support in the biodiversity sector and produce periodic reports to NCB. Aid-Coordination Unit in Cabinet of Ministers, Ministry of Foreign Affairs and the donor community.

● \*\*

## Demonstration / Pilot Projects

For concrete actions under the Action Plan implementation to start and keep the momentum gathered during dev-eloping of the Strategy and Action Plan as well as other projects such as the Transboundary Biodiversity Project, several pilot projects have been identified. These projects, listed below, address the Strategy's first priority ( protected area system):

- protected area system's structure and reorganisation (sect. 1.2 of the Action Plan (AP))
- training and capacities building of protected area system employees (AP sect. 1.3.2)
- biodiversity information system and data base for decision-makers of protected area system (AP sect. 1.4)
- developing of Nuratau biosphere reserve (creation of a biosphere reserve on the basis of the

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existing state reserve), the project is aimed at the primary goal of the biosphere-reserve concept - combination of sustainable use and biodiversity conservation.

The team developing the National Biodiversity Strategy and Action Plan together with UNDP have already begun initial efforts to identify international and local partners to support the above projects. These efforts include tentative communications with IUCN, WWF, German Federation for Nature Conservation (NABU), and others.







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2.2.2. Gain public support for major biodiversity conservation and sustainable use activities prior and during their implementation via the full dissemination of information to the general public and local authorities and communities effected.	SB													
2.2.3 To develop guidelines and a framework for creation of specific local and community biodiversity awareness programs for areas of particular high value / importance to biodiversity conservation and sustainable use	SB													
<b>2.3. Education</b>														
2.3.1 Identify other ongoing activities and initiatives in the field of environmental education	SB													
2.3.2 Organize a group of experts and consultants for revealing the gaps and problems in higher, secondary and specialized secondary education,	SB													
2.3.2. To organize a group of experts and consultants for revealing the gaps and problems in higher, secondary and specialized secondary education.	SB													
2.3.3. Identify the actions required and develop a National Program for <b>Biodiversity Education</b>	SB/ID													
2.3.4. Implement the Program for Biodiversity Education														
<b>2.4. Public participation</b>														
2.4.1 NGO and “Environmental Information” Legislation	SB													
2.4.2 Public Participation in Planning and Management of Protected areas	SB													
2.4.3 Local Biodiversity and Protected Areas Support Groups / Associations	SB													

### 3. SUSTAINABLE USE OF BIODIVERSITY

*Via the controlled use of biodiversity resources, achieve the maximum economic, scientific, recreational and cultural benefits for all the people of Uzbekistan, while at the same time ensuring the long term conservation of biodiversity and viability of ecosystems*





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3.3.3. Identify ecosystems and species of particular cultural significance and develop approaches that conserve features important to the national cultural heritage *		SB										
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\*Key regions are deemed to include main regions and components representing biological and landscape diversity. In many cases these may also include important semi-natural systems.

#### 4. Regional and Local Level Biodiversity Action Plans.

**Section Objective:** *Within the overall framework of the National Biodiversity Strategy and Action Plan, to carry out the creation of regional (Karakalpakstan) or local (Oblast) biodiversity action plans which more specifically meet regional / local requirements and issues.*

4.1: Establishing required organizational structure at regional/ local level												
4.2: Biodiversity Assessment: Preparing assessment of biodiversity situation in region/Oblast, including biodiversity status, importance, and actions required.												
4.3 Preparation and Adoption of Regional / Oblast Biodiversity Action Plan: On basis of assessment, and within the framework of the national biodiversity strategy and action plan, to prepare realistic regional / Oblast biodiversity action plans, indicating the actions to be taken, responsible institutions / organizations, approximate financing, and timetable.		SB										

#### 5. Biodiversity International Affairs and Aid Coordination

**Section Objectives:** *To establish an organizational structure for processing and managing matters concerned with international and regional biodiversity legislation and agreements (conventions on Biodiversity, Ramsar, CITES, et al) and identification, realization and coordination of donor support to implementation of the Uzbekistan Biodiversity Action Plan.*

5.1 Establishment of international Biodiversity Affairs Unit		SB										
5.2 International Legislation and Agreements		SB										

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5.3: Donor Support and Coordination for Biodiversity Strategy and Action  
Plan

		SB													
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Table CC: Breakdown of Arable Land by Main Crops

crop	Arable land (000 ha)				1990
	1960	1970	1980	1985	
Cotton	1387	1709	1878	1990	1721
Grains	a95	1160	1174	969	1080
Fodder's	607	452	722	888	1066
Potato	28	21	23	26	40
Vegetables	38	53	104	108	166
Melons	42	46	52	53	a3
Other	42	35	41	47	45
Total	3038	3476	3995	4080	4194

Table DD: Pasture Types and Distribution

Province	Total Area of Pasture (000 ha)	Pasture types							
		Chul (valley)		Ad yr (foothills)		Tau (mountain)		Yaylau (high mountain)	
		area	%	area	%	area	%	area	%
Karakalpakstan (without Usturt plateau)	3285.5	3285.5	100	0	0	0	0	0	0
Andijan	224.1	8.6	2.8	25.6	11.4	122.6	54.7	67.3	30.0
Bukhara	12857.2	12753.4	99.2	102.8	0.8	0	0	0	0
Djizak	1260.0	379.3	30.1	754.7	59.9	115.9	9.2	10.1	0.8
Kashkadarya	1958.8	644.2	32.9	971.2	49.6	248.6	12.7	94.8	2.8
Namangan	350.1	31.5	9.0	77.5	22.1	147.4	42.1	93.7	26.8
Samarkand	1353.2	407.4	30.1	878.3	64.9	56.8	4.2	10.8	0.8
Surkhandarya	1149.8	167.9	14.6	731.3	63.6	103.5	9.0	147.1	12.8
Syrdarya	116.9	116.9	100	0	0	0	0	0	0
Tashkent	595.2	9.5	1.6	309.5	52.0	147.7	23.8	134.5	22.3
Fergana	245.6	9.8	4.0	17.4	7.1	218.4	88.9	0	0
Khorezm	1064.2	1064.2	100	0	0	0	0	0	0
<b>Subtotal</b>	<b>24460.6</b>	<b>18878.2</b>	<b>77.2</b>	<b>3868.3</b>	<b>15.8</b>	<b>1160.9</b>	<b>4.7</b>	<b>558.3</b>	<b>2.3</b>
Usturt plateau	1064.2	5134.0	100	0	0	0	0	0	0
<b>Total</b>	<b>25524.8</b>	<b>24012.2</b>	<b>94.1</b>	<b>3868.3</b>	<b>15.2</b>	<b>1160.9</b>	<b>4.5</b>	<b>558.3</b>	<b>2.2</b>

Table EE: Irrigation Systems in Uzbekistan and Their Estimated Efficiency (1994)

River basin	Irrigation type (Land Area, 000 ha)				furrow as %	estimated efficiency of furrow (%)
	furrow	drip	sprinkler	total		
Amu Darya	157.0	1.8	0.6	159.3	98.5	68
Syr - darya	183.3	2.1	4.4	190.8	96.6	62
Total for Uzbekistan	341.2	3.9	5.0	350.2	97.4	65

Table FF: Fisheries Information (data from 1981-91, Tashkent State University)

Location and Name	Area (km <sup>2</sup> )	Productivity in kg / ha / yr		Total actual average yield in tons / yr	No. of Species	
		actual	potential		total	used
Aydar - Arnasai	3,000 - 4,000	12 - 18	30 - 40	52500	28	15
Karakalpakstan						
Dautcal	50	17 - 28	30 - 40	1125	>30	14
Ayazkal	90	1 - 3	15 - 20	180		
Akekakul	40	1 - 4	15 - 20	120		
Khojacul lake	47	12 - 20	30 - 40	1034		

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Location and Name	Area (km <sup>2</sup> )	Productivity in kg / ha / yr		Total actual average yield in tons / yr	No. of Species	
		actual	potential		total	used
system						
Karajar "	111	7-14	20-30	1165.5		
Botakul "	20	24-30	30-50	540		
Makpalkul "	26	28-30	40-50	754		
Domalak "	30	14-30	40-50	660		
Atakul	20	7-15	20-40	220		
Mezhdurechen	75	20-30	40-50	1875		
Sudochi	157	5-15	18-20	1570		
Tashapenkul	5	4-11	15-18	37.5		
Karateren	40	4-15	30-40	380		
Muinak Water	97	7-21	40-50	1358		
Sarbas Canal	40	6-15	40-50	420		
Dzkaltirbas Canal	120	2-15	20-25	1020		
Sarykambish Lake	480	--	15-20	--		
Total Kdrakalpakstan	1448			12459	30	14
Khorezm Oblast						
Tuyamuyun	295	1.5-3.9	10-12	796.5	38	21
Uli-Sharkul	20	40-60	90	1000		
Zeikui	15	2.3-11.8	20-40	15.75		
Oblkul	12	11.2-23.3	20-40	207		
Buriyatag	8	6.6-15	20-35	86.4		
Tozakul	8	19-25	20-40	176		
Daryalang	6	3.8-4.1	20-40	23.7		
Okkul	5	3.5-15.7	15-35	48		
Ekchiyar	5	7.4-41.4	20-40	122		
Sharkul	4	22-30	20-40	106		
Meshekli	3	22-30	20-40	78		
Total khorezem	381			2659.35	38	21
Navoi Oblast						
Tudakul	170	20-35	30-60	4675	34	10
Sharkul	45	12-20	30-60	990	23	14
Total Navoi	215			5665		
Sdmarkand Oblast - Kattakurlan	80	1-25.3	18-40	1052	21	8
Djizak Oblast -- Diizak lake	12	6.2-33.4	20-35	237.6		
Bukhara Oblast						
Dengizkul	250	2-12.5	20-30	1812.5	32	18
Karakir	100	1.7-4	12-20	285	--	--
Ayaqitima	70	15.2-27.9	20-30	1508.5	--	--
Tuzgan	57	10-10.9	15-25	595.7	35	17
Total Bukhara	477			4201.7		
Surkhandarya Chlast						
South Surkhand water	65	9-12.6	20-30	702	19	11
Aktepa Amuzgan lake	17	3.1-19.9	20-30	195.5	--	--
system	15	2.8-12.9	15-25	117.75	--	--
Total Surkhandarya Oblast	97			1015.25		
Kashkadarya						

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Location and Name	Area (km <sup>2</sup> )	Productivity in kg / ha / yr		Total actual average yield in tons / yr	No. of Species	
		actual	potential		total	used
system						
Karajar "	111	7-14	20-30	1165.5		
Botakul "	20	24-30	30-50	540		
Makpalkul "	26	28-30	40-50	754		
Domalak "	30	14-30	40-50	660		
Atakul	20	7-15	20-40	220		
Mezhdurechen	75	20-30	40-50	1875		
Sudochi	157	5-15	18-20	1570		
Tashapenkul	5	4-11	15-18	37.5		
Karateren	40	4-15	30-40	380		
Muinak Water	97	7-21	40-50	1358		
Sarbas Canal	40	6-15	40-50	420		
Dzkaltirbas Canal	120	2-15	20-25	1020		
Sarykambish Lake	480	-	15-20	-		
Total Karakalpakstan	1448			12459	>30	14
Khorezm Oblast						
Tuyamuyun	295	1.5-3.9	10-12	796.5	38	21
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Tozakul	8	19-25	20-40	176		
Daryalang	6	3.8-4.1	20-40	23.7		
Okkul	5	3.5-15.7	15-35	48		
Ekchiyar	5	7.4-41.4	20-40	122		
Sharkul	4	22-30	20-40	106		
Meshekli	3	22-30	20-40	78		
Total khorezem	381			2659.35	38	21
Navoi Oblast						
Tudakul	170	20-35	30-60	4675	34	10
Sharkul	45	12-20	30-60	990	23	14
Total Navoi	215			5665		
Samarkand Oblast - Kattakurlan	80	1-25.3	18-40	1052	21	8
Djizak Oblast - Djizak lake	12	6.2-33.4	20-35	237.6		
Bukhara Oblast						
Dengizkul	250	2-12.5	20-30	1812.5	32	18
Karakir	100	1.7-4	12-20	285	-	-
Ayagitma	70	15.2-27.9	20-30	1508.5	-	-
Tuzgan	57	10-10.9	15-25	595.7	35	17
Total Bukhara	477			4201.7		
Surkhandarya Oblast						
South Surkhand water	65	9-12.6	20-30	702	19	11
Aktepa	17	3.1-19.9	20-30	195.5	-	-
Amuzgan lake system	15	2.8-12.9	15-25	117.75	-	-
Total Surkhandarya Oblast	97			1015.25		
Kashkadarya						

Location and Name	Area (km <sup>2</sup> )	Productivity in kg / ha / yr		Total actual average yield in tons / yr	No. of Species	
		actual	potential		total	used
Oblast						
Chimkurgan	49	7.2–30	20–40	911.4	25	10
Talimarjan	77	1.3–3.2	25–30	173.25	31	16
Achin	25	1–3	15–30	50	—	—
Total Kashkadarya Oblast	151			1134.65		
Tashkent Oblast – Charvak	400	1.5–2	12–15	700	10	4
<i>Overall Total</i>	<i>3261</i>			<i>29025</i>		

### Brief Description of Aral Sea Crisis

This lake, half within Uzbekistan (Karakalpakstan) and half within Kazakhstan, had until the 1960's a surface area of 66,000 km<sup>2</sup> and a volume of 1,000 km<sup>3</sup>. A stable water level was maintained by a balance between evaporation from its surface (about 60 km<sup>3</sup>) and the inflow of water from the Amu Darya / Syr Darya rivers plus precipitation (also about 60 km<sup>3</sup>). Between the 1960's and 1980's widespread development of irrigation systems, mainly for cotton production, began to divert substantial amounts of the two rivers to irrigation fields. Much of this water was not returned to the rivers due to loss from evaporation, loss to ground water or because of dumping of irrigation drainage water in desert depressions. As a result the flow of water from the rivers to the Aral reduced to 30% of the original by the 1980's and thus its level has dropped by about 16 m. The Aral is now approximately half its original size, and has split into two parts, one fed by the Amu Darya in the south (Karakalpakstan), and one fed by the Syr Darya in the north (Kazakhstan). Though flow to the Aral has reportedly increased it is still shrinking at an estimated 2 to 3 cm per year.

The direct impacts of this change has been the increase in the salinity of the sea from 10% to 30%, the creation of a highly saline desert about 20,000 km<sup>2</sup> in size on the former seabed and the gradual desiccation of the two delta's. These direct impacts, combined with the direct environmental impact of the overall poor water and land use, have caused a complex of indirect impacts including ecological, climatic, economic, social and health problems. Though historically the Aral has varied considerably in size, never has this change occurred at such a rate (less than 20 years) or in combination with the other negative anthropogenic activities — thus ecosystems and species have not been able to adapt adequately. Of the 24 original fish species said to occur in the Aral only 4 remain. The ecologically rich deltas, "wetlands within deserts", are rapidly deteriorating. Natural vegetation, particularly important Tugai forest, has either been cleared for agricultural purposes or is dying due to changed water regimes. Economically, the desiccation of the Aral has deprived the area and the surrounding nation of the 40,000 tons/annum of fish caught from the sea, transport on the sea and river, employment, and drop in agricultural production. Local climatic changes have produced a more aggressive climate with higher summer temperatures and lower winter temperatures. Salt laden dust storms from the dried seabed pollute land and adversely affect human and animal health. Poor water availability and quality likewise affects health.

### Biodiversity of Uzbekistan

Table GG: Major Taxonomic Groups: Uzbekistan's Share in CIS and The World

S U P E R K I N G D O M
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K I N G D O M S U B K I N G D O M P H Y L U M ( D I V I S I O N ) ( S U B P H Y L U M ) [ S u p e r c l a s s ] C l a s s O r d e r	N u m b e r o f s p e c i e s		
	The world's total	In C I S	In U z b e k i s t a n
P R O C A R Y O T A			
B A C T E R I A	4600		1942
GRACILICUTES			
FIRMICUTES			
TENERICUTES			
ARCHAEBACTERIA	40		?
MENDOSICUTES	40		
V I R A	5000		200
E U C A R Y O T A			
N I M A L I A	1585000		15100
P R O T O Z O A			
		40000	870
S A R C O M	18000		400
(SARCODINA)		11000	150
Lobosea	2000		150
(MASTIGOPHORA)	7000		250
Phytomastigina	3000		100
Zoomastigina	4000		150
S P O R O Z O E A	4000		250
Coccidea	3000		150
Gregarina	1000		100
M Y X O Z O A	700		30
M I C R O S P O R A	900		50
I N F U S O R I A	7000		135
Ciliata	6500		130
Suctorina	500		5
M E T A Z O A	1545000	96000	13400
P O R I F E R A	9000	400	10
Demospongiae	2000	300	10
Cornacuspungida	1500	250	10
C N I D A R I A	9000	500	4
Hydrozoa	2800	300	4
Hydrida	10	5	3
Leptolida	2500	280	1
P L A T H E L M I N T H E S	20000	940	300
Turbellaria	3000	200	30
Trematoda	5000	300	110
Monogenea	2200	160	50
Cestoda		3000	130
N E M A T H E L M I N T H E S	23000	2800	930
Nematodes	20000	2000	800
Nematomorpha	300	30	20
Acanthocephala	500	70	10
Rotatoria	2000	700	100
A N N E L I D E S	15000	1300	61
Polychaeta	7000	750	1
Olygochaeta	5000	400	50
Hirudinea	400	80	10
T E N T A C U L A T A	4300	350	8
Bryozoa	4000	300	8
M O L L U S C A	130000	3000	140



## DRAFT

SUPERKINGDOM			
KINGDOM SUBKINGDOM PHYLUM (DIVISION) (SUBPHYLUM) [Superclass] Class Order	Number of species		
	The world's total	In CIS	In Uzbekistan
Gastropoda	90000	2000	120
Bivalvia		20000	20
TARDIGRADA	300	140	10
ARTHROPODA (CHELICERATA)		1100000	11300
Arachnoidea		60000	800
Scorpiones		750	10
Pseudoscorpiones		1300	13
Solifugae		700	20
<b>Opiliones</b>		4000	5
Aranei		30000	300
Acariformes		15000	160
Parasitiformes		10000	100
Opilioacarina (BRANCHIATA)		50	1
Crustacea 32000		1350	235
Phyllopoda		560	65
Anostraca		180	1
Ostracoda		2000	50
Copepoda		6000	80
Branchiura		60	1
Amphipoda		200	5
Isopoda	220		25
Decapoda		8500	5
Mysidacea (TRACHEATA)		500	3
[ Myriapoda]		53000	33
Pauropoda		350	2
Symphyla		150	1
Diplopoda		50000	10
Glomerida		300	3
Polydesmida		15000	2
Julida		20000	5
Chilopoda		3000	20
Lithobiomorpha		800	7
Geophilomorpha		1000	13
Scolopendromorpha		900	3
Scutigermorpha		300	2
[Insecta]		950000	10170
Entognatha		10500	14
Protura	220	30	1
Collembola		10000	10
Diplura		200	3
Ectognatha		940000	10142
Thysanura		400	10
Ephemeroptera		2500	30
Odonatoptera		4500	80
Blattoptera		4000	30
Mantoptera		2000	10
Isoptera		2600	3
Plecoptera		2000	25
Embioptera		200	1

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SUPERKINGDOM			
K I N G D O M S U B K I N G D O M P H Y L U M (D I V I S I O N) (S U B P H Y L U M) [Superclass] Class Order	Number of species		
	The world's total	In CIS	In Uzbekistan
Phasmoptera	2500	8	5
Orthoptera	20000	700	400
Dermaptera	1300	26	8
Psocoptera	1500	70	10
Mallophaga	2500	400	30
Anoplura	300	40	30
Homoptera	35000	4000	900
Hemiptera	35000	2500	700
Thysanoptera	4500	360	140
Coleoptera	300000	5000	3000
Raphidioptera	180	30	8
Neuroptera	3500	350	140
Mecoptera	500	35	2
Trichoptera	3000	300	50
Lepidoptera	150000	15000	1500
Hymenoptera	130000	15000	1500
Aphaniptera	1000	400	80
Diptera	120000	10000	1500
CHORDATA	45000	2500	664
(VERTEBRATA)	43000	1800	664
[Pisces]	22000	500	83
Osteichthyes	21200	490	83
Acipenseriformes	25	14	5
Clupeiformes	331	5	1
Zypriniformes	2422	120	508
Salmoniformes	320	40	6
Zyprinodontiformes	845	1	2
Atheriniformes	235	2	1
Zasterosteiformes	10	4	1
Scorpaeniformes	1160	80	3
Perciformes	7791	64	13
Pleuronectiformes	538	45	1
Amphibia	2300	34	2
Anura	1800	23	2
Reptilia	6750	147	58
Testudines	250	7	1
Squamata	6500	140	57
Aves	9672	764	424
Caviiformes	5	5	2
Podicipitiformes	21	5	5
Pelecaniformes	55	12	4
Ciconiiformes	118	24	12
Phoenicopteriformes	3	1	1
Anseriformes	150	58	35
Falconiformes	290	55	40
Galliformes	269	21	7
Gruiformes	200	24	13
Charadriiformes	300	134	70
Columbiformes	269	18	12
Cuculiformes	149	6	3
Strigiformes	144	18	8
Caprimulgiformes	104	3	2

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SUPER KINGDOM			
KINGDOM SUB KINGDOM PHYLUM (DIVISION) (SUBPHYLUM) [Superclass] Class Order	Number of species		
	The world's total	In CIS	In Uzbekistan
Apodiformes	265	5	5
Coraciiformes	162	11	5
Piciformes	379	15	2
Passeriformes	5100	337	203
Mammalia	4327	332	97
Insectivora	367	42	5
Chiroptera	650	40	19
Lagomorpha	61	13	2
Rodentia	1597	150	40
Carnivora	232	44	23
Artiodactyla	159	24	8
FUNGI	18000		1953
PLANTAE	250000		8000
RHODOBIONTA			3
PHYCOBIONTA	16200		4146
EMBRYOBIONTA	30000		4500

Table HH: Composition of Uzbekistan's Ichthyoфаuna

Taxon	Origin
Class: Osteichthyes	
Order: Acipenseriformes	
Acipenseridae	
1. Acipenser nudiventris	Indigenous
2. A. stellatus	Introduced
3. Pseudoscaphirhynchus fedchenkoi	Indigenous
4. P. kaufmanni	Indigenous
5. P. hermanni	Indigenous
Order: Clupeiformes	
1. Clupea harengus membras	Introduced
Order: Salmoniformes	
Salmonidae	
1. Salmo gairdneri	Introduced
2. S. trutta orientalis	Indigenous
3. S. ischchan	Introduced
Coregonidae	
1. Coregonus sardinella	Introduced
2. C. peled	Introduced
Order: Esociformes	
1. Esox lucius	Indigenous
Order: Cyprinodontiformes	

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Poecilidae

1. *Cambusia affinis*..... Introduced

Oryziatidae

1. *Oryzias latipes*..... Introduced

Order: Cypriniformes

Cyprinidae

1. *Hypophthalmichthys molitrix*..... Introduced  
2. *Aristichthys nobilis*..... Introduced  
3. *Carassius auratus*..... Indigenous  
4. *Cyprinus carpio*..... Indigenous  
5. *Schizothorax intermedius*..... Indigenous  
6. *Schizopygopsis stoliczkai*..... Indigenous  
7. *Diptychus maculatus*..... Indigenous  
8. *D. dybowskii*..... Indigenous  
9. *D. sewerzovi*..... Indigenous  
10. *Pelecus cultratus*..... Indigenous  
11. *Hemiculter leucisculus*..... Accidentally brought  
12. *Capoetobrama kuschakewitschi*..... Indigenous  
13. *Parabramis pekinensis*..... Accidentally brought  
14. *Abramis sapa*..... Indigenous  
15. *A. brama orientalis*..... Indigenous  
16. *Chalcalburnus chalcoides aralensis*..... Indigenous  
17. *Alburnoides bipunctatus eichwaldi*..... Indigenous  
18. *A. taeniatus*..... Indigenous  
19. *A. oblongus*..... Indigenous  
20. *Rhodeus ocellatus*..... Accidentally brought  
21. *Scardinius crithrophthalmus*..... Indigenous  
22. *Phoxinus phoxinus*..... Indigenous  
23. *Aspius aspius taeniatus*..... Indigenous  
24. *Aspiolucius esocinus*..... Indigenous  
25. *Opsariichthys uncirostris amurensis*..... Accidentally brought  
26. *Pseudorasbora parva*..... Accidentally brought  
27. *Rutilus rutilus aralensis*..... Indigenous  
27a. *R. r. bucharensis*..... Indigenous  
28. *Leuciscus idus oxianus*..... Indigenous  
29. *Leuciscus lehmanni*..... Indigenous  
30. *L. squalisculus*..... Indigenous  
31. *Mylopharingodon plicatus*..... Introduced  
32. *Ctenopharingodon idella*..... Introduced  
33. *Gobio gobio lepidolaemus*..... Indigenous  
34. *Pseudogobio rivularis*..... Accidentally brought  
35. *Tinca tinca*..... Introduced  
36. *Varicorhinus capoeta heratensis*..... Indigenous  
37. *Barbus brachicephalus*..... Indigenous  
38. *B. capito conocephalus*..... Indigenous

Cobitidae

1. *Cobitis aurata aralensis*..... Indigenous  
2. *Nemachilis malapterurus longicauda*..... Indigenous  
3. *N. oxianus*..... Indigenous  
4. *N. amudariensis*..... Indigenous  
5. *N. kuschakevitschi*..... Indigenous  
6. *N. pardalis*..... Indigenous  
7. *N. dorsalis*..... Indigenous  
8. *N. labiatus*..... Indigenous  
9. *N. stoliczkai*..... Indigenous  
10. *N. strauchi*..... Indigenous

Order: Siluriformes

Siluridae

1. *Silurus glanis*..... Indigenous

Sisoridae

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1. *Glyptosternum reticulatum*.....Indigenous
- Order: Casterosteiformes  
Casterosteidae  
1. *Pungitius platygaster aralensis*.....Indigenous
- Order: Perciformes  
Percidae  
1. *Cymnocephalus cernua*.....Indigenous  
2. *Stizostedion lucioperca*.....Indigenous  
3. *Perca fluviatilis*.....Indigenous  
4. *P. schrenki*.....Introduced
- Gobiidae  
1. *Rhinogobius similis*.....Accidentally brought  
2. *Potamoschistus caucasicusp*.....Accidentally brought  
3. *Protocorhinus marmoratus*.....Accidentally brought  
4. *Neogobius melanostomus*.....Accidentally brought  
5. *N. fluviatilis*.....Accidentally brought  
6. *N. kessleri*.....Accidentally brought  
7. *N. syrmanp*.....Accidentally brought
- Eleotriidae  
1. *Hypseleotris cinctus*.....Accidentally brought
- Channidae  
1. *Channa argus warpachowskii*.....Accidentally brought
- Order: Scorpaeniformis  
Cottidae  
1. *Cottus gobio jaxartensis*.....Indigenous  
2. *C. nasalis*.....Indigenous  
3. *C. spinulosus*.....Indigenous
- Order: Pleuronectiformes  
Pleuronectidae  
1. *Platichthys flesus luscus*.....Introduced
- Order: Atheriniformes  
Atherinidae  
1. *Atherina boyeri caspia*.....Introduced

**List of Rare and Distinction-Endangered Animal Species (Sub-Species)**

**МЛЕКОПИТАЮЩИЕ — МАММАЛИА  
— СУТЭМИЗУВЧИЛАР**

1. Длиннохвостая ночница — *Muotis froter* (G. Allen, 1923)  
Узунбармокли туншапалак  
*Landshwanziges Mausohr*  
Category 3.  
Rare, poorly studied large bat. Used to inhabit caves and mining galleries in the vicinities of Samarkand city. Colonies consisted of 100 to 500 animals. Contemporary condition is unknown.
2. Широкоухий складчатогуб —  
*Tadarida teniotis* (Rafinesque, 1814)

- Шалпангкулок куршапалак  
Bulldog Fledermaus Free — Tailed Bat  
Category 3.  
Rare, poorly studied large bat. Found scatterly on Babadag range and, in isolated cases, in Western Tien — Shan. Lives in small colonies counting 20 to 30 animals in rocks and foothill precipices. Poorly studied.
3. Тяньшанский бурый медведь —  
*Ursus arctos isabellinus* (Horsfield, 1.826)  
Кунгир айик  
Broun Bear (Thien Than)  
Category 4.

The numbers of this species have stabilised within its contemporary habitat. Inhabites mountain systems of Western Tien – Shan and Pamir – Alay. Relatively common. Successing in several areas. Total numbers are assessed to be 600 animals. Included into the Appendix I of IUNP.

4. Индийский медоед – *Mellivora capensis indica* (Kerr., 1792)

Хинд асалхури

Honey Badger

Category 3.

Rare species inhabiting northern marginal areas. Lives in ravines and plateau precipices, and deserts of SW Karakalpakstan. Scanty over its entire habitat.

5. Среднеазиатская выдра – *Lutra lutra seistfnica* (Burila, 1912)

Урта осие кундузи

Centralasian Otter

Category 3.

Rare sub – species decreasing in numbers. Inhabits upper parts of Amudarya and basins of mountain rivers of Pamir- Alay. Scanty over its entire habitat. Total numbers are assessed not to exceed 150 animals. Included into the Appendix II of CITES.

6. Полосатая гиена – *Hyaena hyaena* L., 1758

Сиртлон дулта

Striped hyena

Category 0.

Species close to extinction. Used to inhabit foothills of Kughitang, floodlands of upper Amudarya, and Babatang range. Modern data are limited.

7. Переднеазиатский леопард – *Panthera pardus tullianus* (Valencienus, 1856)

Коплон

Leopard Panther

Category 0.

Very rare extinction endangered sub – species. Used to be observed in Babatang and Kughitang mountains. Several animals possibly survived.

Registered in the Red Book of IUNP (under Category I) and the Appendix I of CITES.

8. Туркменский каракал – *Felis caracal michaelis* (Heptner, 1945)

Коракулок

Caracal

Category 2. Rare sub-species with extremely low and decreasing population. Inhabits Oustourt plateau, NW Kyzylkoum, and low parts of Amudarya. Absence of modern data may witness vanishing of this sub -species from a major part of its habitat.

Registered in the Red Book of IUNP (under Category I) and the Appendix I of CITES.

9. Туркестанская рысь – *Felis lynx isabelina* (Blythy, 1847)

Силовсин

Turkestan lynx

Category 3. Rare sub-species. Inhabits mountain ranges of Pamir – Alay. Population is low but relatively stable not possibly exceeding 100 to 150 species. Registered in the Appendix II of CITES.

10. Снежный барс – *Uncia uncia* (Schreb., 1775)

Ирбис

Snow leopard

Category 2. Rare, but not directly extinction endangered as yet. Inhabitans of high mountains of Tien – Shan and Pamir – Alay. Assessments of populations varies from 30 to 50 animals.

11. Бухарский олень – *Cervuus elaphus bactrianus* (Lydekker, 1990)

Хонгул

Bukhara Deer

Category 1. Extinction endangered. Survived in river – side forests of Amudarya -basin zapovedniks— Surkhan, Kyzylkoum, and Baday— Tugay. The total population is 300 animals. These numbers still tend to decrease. Registered in the Red Book of IUNP (under Category I) and the Appendix II of CITES.

12. Джейран — *Gazella subguttarosa*  
(Guld, 1790)

Коракуйрук, шайрон  
Goitred Gazelle

Category 2. Decreasing in numbers species. Inhabits lowland parts of the country excluding eastern regions. Scanty everywhere. According to different assessments, the population has decreased from 8 – 10 down to 3,000 animals.

13. Винторогий козел — *Capra falconery* (Wagn., 1839)

Мархур  
Markhor

Category 3. Small population on decreasing inhabitat. Survived in three isolated parts of inhabitat-Babatag, Kughitang, and Baysountau mountain ranges. Population is assessed to be no more than 300 to 400 animals. Registered in the Red Book of IUNP and the Appendix II of CITES.

14. Устюртский муфлон — *Ovis orientalis arcal* (Eversmann, 1850)

Устюрт куйи аркал  
Ustyurt mufflon

Category 2. Rare sub -species whose population is decreasing. Inhabits steep slopes and precipices in southern part of Oustourt plateau. Population used to count several hundred animals; current figures are unknown.

15. Баран Северцова — *Ovis orientalis scvertzovi* (Nasonov, 1914)

Кизилкум еввойи куйи  
Severtsov's urial

Category 4. Current situation is rather stable, though continual monitoring is required. Inhabits Nuratau range and Tamdytau mountain remnants. Population in main part of habitat is 2,500 animals and several tens of animals-in the rest, where it is possibly decreasing. Registered in the Appendix II of CITES.

16. Бухарский баран — *Ovis orientalis boharensis* (Nasonov, 1914)

Бухоро куйи

Bukhara Arkhar

Category 2. Decreasing in numbers and, possibly, extinction endangered. Survived on isolated areas of Babatang, Baysountau, and Kughitang ranges. Population is low, not possibly exceeding 200 to 300 animals. Registered in the Red Book of IUNP (under Category II) and the Appendix II of CITES.

17. Сурок Мензбира — *Marmota menzbieri* (Kaschk., 1925)

Кук сугур  
Menzbier's marmot  
Category 3.

Limited-habitat endemic in Western Tien – Shan. Population is steadily decreasing. Inhabits SW slopes of Chatkal range, Angren plateau, and Kuramin range. According to assessments, its total population used to be 36 to 38,000 animals; now it is about 22,000. Registered in the Red Book of IUNP (under Category III) and the Appendix II of CITES.

#### ПТИЦЫ — AVES — КУШЛАР

1. Розовый пеликан — *Pelecanus onocrotalus* (Linnaeus, 1758)

Биркозон  
Great White Pelican

Category 2. Both numbers and habitat are decreasing. Migratory bird. Sometimes spends winter at reservoirs in southern and central parts of Uzbekistan. Population on lakes in low parts of Amudarya is assessed to be 700 couples.

2. Кудрявый пеликан — *Pelecanus crispus* Bruch, 1832

Жингиладор биркозон  
Dalmatian Pelican

Category 2. Both numbers and habitat are steadily decreasing. Migratory bird. So far, there are its nesting places on lakes in low parts of Amudarya and artificial reservoirs in low parts of Zcrafshan and mid Syrdarya. The total numbers of nesting pelicans is assessed to be about 250 couples. Listed in the Red Book of IUNP as a vulnerable

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species. Included into Appendix II of SITES.

3. **Малый баклан** — *Phalacrocorax pygmaeus* (Pallas, 1773)  
Корабузов, коравой  
Pygmy Cormorant  
Category 3. A migratory, scattcrly found species whose numbers have fallen down severely. Transit and wintering birds are found in central and southern parts of the country. Registered in the Red Book of IUNP.

4. **Малая белая цапля** — *Egretta garzetta* (Linnaeus 1766)  
Кичик ок кутон  
Little Egret  
Category 3. A rare, poorly studied species. Migratory bird. Principle places of nesting are located in low and middle parts of Amudarya, where about 320 couples nest.

5. **Колпица** — *Platalea leucorodia* (Linnaeus, 1758)  
Кошикбурун  
White Spoonbill  
Category 3. A rare, scatterly distributed species, decreasing in numbers. Migratory bird. Nests in low and middle parts of Amudarya and Syrdarya. The total numbers of nesting couples are assessed not to exceed 150. Included into Appendix II of SITES.

6. **Каравайка** — *Plegadis falcinellus* (Linnaeus, 1766)  
Корабой  
Glossy Ibis  
Category 2. A tcssclatedly distributed species, whose numbers and habitat in Uzbekistan are constantly decreasing. A migratory bird. Nests on lakes in Aral Sea vicinities. About 1,400 couples are found in Amudarya delta.

7. **Белый аист** — *Ciconia ciconia* (Linnaeus, 1758)  
Ок лайлак  
White Stork  
Category 4. A species with decreasing habitat, but locally increasing population. Requires monitoring. A

migratory bird, though some part of population winters in Fergana valley and the country's south. Inhabits human-transformed territories in lowland regions. Nests by couples or by colonies known at Chinaz (about 50 nests) and in Fergana valley (about 1,300 nests). Included into the Appendix II of CITES.

8. **Черный аист** — *Ciconia nigra* (Linnaeus, 1758)  
Кора лайлак  
Black Stork  
Category 3. A rare species. Migratory bird. Nests in rocks along ravines in Western Tien — Shan and Pamir — Alay. Found in lowlands during migrations. Irregularly winters in southern parts of the country. Included into the Appendix II of CITES.

9. **Лебедь — шипун** — *Cygnus olor* (Gmelin, 1789)  
Ок куш  
Mute Swan  
Category 2. A species with both population and habitat decreasing. Can stop nesting in the country-on Karakir and Sudochye lakes (20 to 30 couples). Single birds can be rarely found on any large reservoir. Population of migrating birds is assessed to be within 100 examples; 20 to 30 spend winter.

10. **Мраморный чирок** — *Anas angustirostris* (Menetries, 1832)  
Мармар чуррак  
Marbled Teal  
Category 1. A species with both population and habitat decreasing. Encounters with birds nesting on shallow lakes in Amu — Bukhara channel region have been registerd. While migrating, can be observed in southern Uzbekistan. According to expert assessments, up to 100 couples migrate and nest. The species is listed in the Red Book of IUNP, as endangered, and included into the Appendix II of CITES.

11. **Скопа** — *Pandion haliaetus* (Linnaeus, 1758)  
Суз кийгир



Osprey

Category 2. A species with decreasing both population and habitat. Scanty migratory bird. A single authentic case of nesting in the country was observed in low parts of Amudarya. More common when 'migrating; adheres to reservoirs. Included into the Appendix II of CITES.

12. Змееяд – *Circaetus gallicus*  
(Gmelin, 1788)

Илон бургут

Short -toed Eagle

Category 2. A rare species with both population and habitat decreasing. Migratory bird. Nests in natural habitats on lowlands and low and middle belts of Tien – Shan and Pamir – Alay mountains. When migrating, can be also found in human -transformed areas. Thirty to 40 couples nest. Included into the Appendix II of CITES.

13. Орел- карлик – *Hieraetus pennatus* (Gmelin, 1788)

Кичик бургут

Booted Eagle

Category 4. A rare species, whose population and habitat dynamics require monitoring. Migratory bird. Nests in floodland mountain forests of Tien – Shan and Pamir – Alay. When migrating, can be found all over the country's territory. About 75 to 85 couples nest. Included into the Appendix II of CITES.

14. Ястребиный орел – *Hieraetus fasciatus* (Vieillot, 1822)

Киргий бургут

Vonell's Eagle

Category 0. An extincting species. Has been seen at SW outskirts of Karnabchoul during spring migration. There are no data concerning possible nesting. Very rare. Included into the Appendix II of CITES.

15. Степной орел – *Aquila rapax*  
(Temminck, 1828)

Коракуш

Steppe Eagle

Category 2. A rare species with both population and habitat decreasing.

Migratory bird. Nests in small numbers on Oustourt plateau only. When migrating, common in lowland regions. May winter in southern parts of the country in unsnowy years. No more than 10 couples nest. Included into the Appendix II of CITES.

16. Могильник – *Aquila heliaca*  
(Savigny, 1809)

Киронкора

Imperial Eagle

Category 2. A rare species with both population and habitat decreasing. Migratory bird. Scanty examples nest scatterly in wild areas of Oustourt plateau and northern Kyzylkoum. Numbers do not probably exceed several tens of couples. More common during migration, but is observed only on lowland territories. Belongs to rare species of the Red Book of IUNP, is included into the Appendix II of CITES.

17. Беркут – *Aquila chrysaetos*  
(Linnaeus, 1758)

Бургут

Golden Eagle

Category 3. A scanty species, whose well-being can be affected by environmental changes. Nonmigratory bird inhabiting not very much transformed natural landscapes. About 100 couples live in the country. Included into the Appendix II of CITES.

18. Бородач – *Gypaetus barbatus*  
(Linnaeus, 1758)

Болтаюгар

Bearded Vulture

Category 4. A rare species, whose population and habitat dynamics require monitoring. Nonmigratory bird found in every mountain system. Inhabits rocky massives in low and middle mountain belts. Numbers are assessed to be 150 to 160 birds. Included into the Appendix II of CITES.

19. Черный гриф – *Aegypius monachus* (Linnaeus, 1766)

Таскара

Cinereous Vulture

Category 4. A species requiring constant monitoring. Nonmigratory bird. Nests in low and middle mountain belts.

According to current data, about 60 couples nest in the country. The largest community accounting 40 to 45 couples lives in Nurata' zapovednik; the rest of the country's territory is inhabited by isolated couples. The total population, though decreasing, exceeds numbers of nesting birds by several times. Belongs to vulnerable species of the Red Book of IUNP, is included into the Appendix II of CITES.

20. Белоголовый сип — *Gyps fulvus* (Hablizl, 1783)

Ок бошли кумой  
Griffon Vulture

Category 4. A species requiring constant monitoring. Nonmigratory bird nesting in low and middle mountain belts. Nesting of about 130 couples is proven, although the total population is much greater. Included into the Appendix II of CITES.

21. Кумай — *Gyps himalayensis* (Hume, 1869)

Кумой  
Himalayan Griffon

Category 3. A rare species with limited habitat. Nonmigratory bird. Inhabits high mountains of Pamir — Alay and, possibly, Western Tien — Shan. Estimated population is several tens of examples. Included into the Appendix II of CITES.

22. Балобан — *Falco cherrug* (Gray, 1834)

Йтолги  
Sfker Falcon

Category 4. A rare species, whose population and habitat dynamics require monitoring. Predominantly nonmigratory bird. Inhabits Western Tien — Shan, Pamir — Alay, residual hills of Kyzylkoum, Oustourt, floodlans of Amudarya and Syrdarya. According to expert assessment, the population of nesting birds is 100 to 150 couples. During Winter and Autumn population increases due to movement from NE

regions. Included into the Appendix: II of CITES.

23. Шахин — *Falco pelegrinoides* (Temminck, 1829)

Сахро лочин  
Barbary Falcon

Category 3. A rare species with limited habitat. Scatterly distributed among desert low mountain areas and plains in mountain vicinities. Some part of population are nonmigratory, behaviour of the other requires further study. Included into the Appendix II of CITES.

24. Зеравшанский фазан — *Phasianus colchicus zeravschanicus* (Tarnovski, 1891)

Зарафшон кирговули

Zeravshan Common Pheasant

Category 2. An indigenous sub -species with both population and habitat decreasing. Nonmigratory bird, whose population has slightly increased over the recent years due to expansion from the Zerafshan zapovednik into galleries and agrosystems of Zcrafshan. About 2,000 birds live in the Zerafshan zapovednik and 500—in the Vardazin zakaznik. The total population in the country is 4,000 to 5,000 birds.

25. Стрепет — *Otis tetrax* (Linnaeus, 1758)

Бизгалдоқ  
Little Bustard

Category 2. Extinction endangered in Uzbekistan. Single birds are very rarely found on lowlands in E and SE Uzbekistan during spring and autumn migrations.

26. Дрофа — красотка или джек — *Chlamydotis undulata macgweenii* (J.E. Gray, 1832)

Йурга — тувалок  
Houbara Bustard

Category 2. A species, whose population and habitat are rapidly decreasing. Migratory bird. Related to clay — s-ony deserts with crossed relief. The total numbers of nesting birds, according to expert assessments, are about 2,000; figures for migrating birds are 5,000 to

7,000. The species is registered in the Red Book of IUNP as oppressed and included into the Appendix I of CITES.

27. Черноголовый хохотун — *Larus ichthyaetus* (Pallas, 1773)

Корабошли баликчи

Great Black — headed Gall

Category 3. A rare wintering species.

Nests in low parts of Amudarya and at southern shores of the Aral Sea. Found on big lakes of the country.

28. Белобрюхий рябок — *Pterocles alchata* (Linnaeus, 1766)

Окбовур, буддурук

Pin -tailed Sandgrouse

Category 2. A species with both population and habitat decreasing. Can be nesting, migratory, or rarely wintering. Nests scatterly on sandy areas in Kyzylkoum where watering places are guaranteed. During migrations is observed in colonies counting up to 20 to 40 birds. Population of the species is decreasing catastrophically.

29. Филин — *Bubo bubo* (Linnaeus, 1758)

Укки

Eagle Owl

Category 2. A species whose numbers and habitat are decreasing due to taking foothill and lowland territories for agriculture. Nonmigratory bird. Found on Oustourt, in Kyzylkoum, wild areas of Karshi steppe, and foothills of all mountain systems of the country. категория. Rare in middle and upper mountain belts. Included into the Appendix II of CITES.

ПРЕСМЫКАЮЩИЕСЯ — REPTILIA  
— СУДРАЛИБЮРУВЧИЛАР

1. Хентаунская круглоголовка — *Phrynocephalus rossikovi* (Nikolsky, 1899)

Хентон курбакабоши

Chentaun's Toad Agama

Category 1. A relic form with limited habitat, at the edge of extinction.

Inhabits Karakalpakstan and bordering

regions in Khorezm province. Lives -in loamy with small detritus, sandy, and sandy-loamy soils with scarce vegetation. Population is low everywhere. Population density and habitat tend to decrease.

2. Круглоголовка Штрауха — *Phrynocephalus strauchi* (Nikolsk.y, 1899)

Штраух курбакабоши

Strauch Toad Agama

Category 2. Endemic in Fergana valley with rapidly shrinking habitat. Inhabites sandy massives in central part of Fergana valley. Population is decreasing sharply due to irrigation.

3. Сцинковый геккон Рустамова — *Teratoscincus scincus rustamowi* (Szc., 1979)

Rustamovi Plate -tailed Gecko

Category 2. An endemic sub — species with limited and shrinking habitat. Found in central part of Fergana valley on semi — consolidated or bare sands or, more rarely, on clay foothill lands. Population decreases catastrophically by irrigation or ploughing.

4. Ферганская ящурка — *Eremias scripta pherganensis* (Szc. et Waslh., 1973)

Чипор калтакесак

Sand Racerunner

Category 2. An extincting sub — species endemic in Uzbekistan. Inhabits central parts of Fergana valley. Lives on quick, semi — consolidated, or consolidated. sands. Population is decreasing due to taking lands for agriculture.

5. Серый варан — *Varanus griseus* (Daudin, 1893)

Эчкемар

Desert Monitor

Category 2. A species with rapidly shrinking habitat. Inhabits almost entire lowland territory of Uzbekistan—from the Aral Sea shore to sands of Fergana valley. Lives in sandy deserts, along — river territories, or in low mountain areas. Population is most stable in sands of Kyzylkoum, extinction endangered—

in Fergana valley, and strongly decreasing-in southern parts of the country. The species is registered in the Red Book of IUNP (Category II) and included into the Appendix I of CITES.

6. Среднеазиатская кобра — *Naja oxiana* (Eichwald, 1831)  
Капчабаш илон  
Oxus (Central Asian) Cobra  
Category 4. A species with relatively stable condition, though requiring regular monitoring. Inhabits foothills and mountains of Pamir — Alay system. There is a tendency to scattering of inhabitat. The species is registered in the Red Book of IUNP (Category I).

#### РЫБЫ — PISCES — БАЛИКЛАР

1. Аральский шип — *Acipenser nudiventris* (Lovetsky, 1828)  
Бахри балик, бакра, бекре  
Bastard Sturgeon, ship  
Category 1. A rare, extincting on some parts of habitat species. Used to inhabit shallow littoral areas of the Aral Sea. Found in Amudarya and Syradarya. After the seventieth, only single examples were registered.

2. Амударьинский большой лопатонос — *Pseudoscaphirhynchus kaufmanni* (Bogdanow, 1874)  
Килкуйрук, амударе катта куракбуруни, сурмай  
Big Amu — dar Shovelnose  
Category 1. A very rare extincting endemic species. Inhabits Amudarya, is found in reservoirs in low parts of Zerafshan and Kashkadarya. For the last 10 — 15 years, only very rarely was observed. Contemporary condition is unknown.

3. Амударьинский малый лопатонос — *Pseudoscaphirhynchus hcrmani* (Kesler, 1877)  
Тошбакра, амударе кичик куракбуруни  
Little Amu — dar Shovelnose  
Category 1. A very rare endemic species. Used to be found only in Amudarya—all along its entire length.

Used to come into resevoirs in low parts of Kashkadarya and Zerafshan. Has not been registered for the last 20 years. Possibly extinct in many parts of the river.

4. Сырдарьинский лопатонос — *Pseudoscaphirhynchus fedtschenkoi* (Kessler, 1872)  
Филбуйин сирдаре куракбуруни  
Syr — dar Shovelnose  
Category 0. An exeptionally rare, possibly extinct species. Used to inhabit Syrdarya and its reservoirs—all along the entire river's length. There has been no trustworthy indications of the species' existence since 1970. Possibly survived in upper parts of Syradarya.

5. Аральская кумжа — *Salmo trutta aralensis* (Berg, 1908)  
Орон сулаймонбалиги  
Aral Trout  
Category 0. A rare unique sub-species. Known to inhabit the Aral Sea and low parts of Amudarya only. Scanty dunmg observed history. There has been no trustworthy indications of the species' existence since 1950. Virtually not found now, possibility of complete extinction is not excluded.

6. Щуковидный жерех, жерех — лысач — *Aspiolucius esocinus* (Kessler, 1874)  
Кал балик, чурган марка  
Pike asp.  
Category 3. A rarely found endemic species with shrinking habitat. Inhabits Amudarya and Syradarya only. Found in plain parts of Karadarya and Chirchik. Penetrated into resevoirs of Kashkadarya and Zerafshan basins. Only single examples have been observed since the eightieth.

7. Аральский усач — *Barbus brachycephalus* (Kessler, 1872)  
Суген, орол муйловдори, козикшим  
Aral Barbel  
Category 2. A rare species whose habitat is shrinking dangerously fast. Inhabits the Aral Sea basin, Amudarya and Syradarya basins, and reservoirs in. low parts of Zerafshan and Kashkadarya.

Only single examples have been caught since 1980. Contemporary condition is unknown.

8. Чешуйчатый осман — *Diptychus maculatus* (Stemdnachner, 1866)

Тангачали кукча, тангачали осман  
Scaled Osman

Category 2. A rare poorly studied species. Inhabits upper parts of Syrdarya and Naryn. There are virtually no data of its population. категория. Over the recent years has become very rare.

9. Остролучка — *Carotobrama kuschkewitschi* (Kessler, 1872)

Паррак  
Ostroluchka

Category 2. A rare endemic species with decreasing population. Inhabites Amudarya and Syrdarya all along their length. Presents in Kashkadarya and Surkhandarya. Population has severely dropped since the eightieth. Caught by single examples.

10. Аральская белоглазка — *Abramis sara aralensis* (Tiarkin, 1939)

Ок Куз балик КОраКуз  
Aral White — eye

Category 3. A rare decreasing in numbers sub-species. Used to live all over the Aral Sea. Found in reservoirs of low parts of Amudarya. Inhabites Syrdarya up to low parts of Naryn and Karaclarya, found in low parts of Chirchik and Akhangaran. Has been caught only by single examples since the eightieth.

### List of Animal Species (Sub-Species) Subject to Special Protection and Specific Rules of Use

МАММАЛИА — МЛЕКОПИТАЮЩИЕ  
— СУТЭМИЗУВЧИЛААР

1. Длинноиглый еж — *Hemiechinus hypomelas* (Brandt, 1836)

Узун игнали типратикан

2. Пегий путорак — *Diplomesodon pulchellum* (Lichtenstein, 1823)

Чавкар путорок

3. Белобрюхий стрелоух — *Otonycteris hemprichi* (Peters, 1859)

Уккулук куршапалак

4. Длиннопалая ночница — *Myotis macrodactylus* (Temminck, 1840)

Узун бармокли туншапалак

5. Перевязка — *Vormela peregusna* (Guld, 1770)

Олакузан

6. Барханный кот — *Felis margarita* (Loche, 1858)

Кум мушутти., Кум пишак

7. Манул — *Felis manul* (Pallas, 1778)  
Дала мушук

8. Тяньшанский архар — *Ovis ammon Karelini* (Severtzov, 1873)

Тяньшон куйи архар

9. Карликовый тушканчик Гептнера — *Salpingotus heptneri* Vorontzovet (Smirnov, 1969)

Митти кушоек

10. Туркменский тушканчик — *Jaculus turkmenicus* (Vinogradov et Bondar, 1949)

Туркман кушоек

11. Приаральский толстохвостый тушканчик — *Salpingotus crassicauda* (Vinogradov, 1924)

Йузондумли кушоек

Of specially protected species, sand — dune cat and 'manoul' [manul] are registered in the Red Book of IUNP. Tien — Shan arkhar is included into -the Appendix II of CITES.

## A V E S — ПТИЦЫ — КУШЛАР

1. Желтая цапля — *Ardeola ralloides* Scop.  
Сарик кутон '  
Sguacco Heron
2. Фламинго — *Phoenicopterus roseus* Pall.  
Кизил гоз  
Flamingo
3. Краснозобая казарка — *Rufibrenta ruficollis* Pall.  
  
Red — breasted Goose
4. Пискулька — *Anser erythropus* L.  
Ок пешонали кичик гоз  
Lesser White -fronted Goose
5. Лебедь — кликун — *Cygnus cygnus* L.  
Оккуш  
Whooper Swan
6. Малый лебедь — *Cygnus bewickii* Yar.  
Кичик оккуш  
Bewick's Swan
7. Обыкновенный турпан — *Melanitta fusca* L.  
Кора урдак  
Velvet Scoter
8. Савка — *Oxyura leuccephala* Scop.  
Окбош урдак  
White -headed Duck
9. Черный коршун — *Milvus migrans* Bod.  
Кора колхат  
Black Kite
10. Орлан — долгохвост — *Haliaeetus leucorhynchus* Pall.  
Узундумли сувбургут  
Pallas' Sea Eagle
11. Орлан — белохвост — *Haliaeetus albicilla* L.
12. Стервятник — *Neophron percnopterus* L.  
Журчи, Калжурчи  
Egyptian Vulture
13. Сапсан — *Falco peregrinus* Tunst.  
Лочин  
Peregrine Falcon
14. Чеглок — *Falco subbuteo* L.  
Жиголтой  
Nothorn Hobby
15. Дербник — *Falco columbarius* L.  
Турумтой  
Merlin
16. Степная пустельга — *Falco naumanni* Fleisch.  
Куйка  
Lesser Kestrel
17. Стерх — *Grus leucogeranus* Pall.  
Ок турна  
Siberian Crane
18. Серый журавль — *Grus grus* L.  
Кук еки тош турна  
Common Crane
19. Журавль — красавка — *Anthropoides virgo* L.  
Кичик турна  
Demoiselle Crane
20. Коростель — *Crex crex* L.  
Тартап  
Corn Crake
21. Дрофа — *Otis tarda* L.  
Дудак тувалок  
Great Bustard
22. Кречетка — *Chettusia gregaria* Pall.  
Торгок  
Sociable Lapwing
23. Тонкоклювый кроншнеп — *Numenius tenuirostris*  
  
Slender — billed Curlew

24. Азиатский бекасовидный веретенник — *Limnodromus semipalmatus* Blyth.  
Осие лойхураксимон веретенниги  
Shipe — billed Godwit
25. Чернобрюхий рябок — *Pterocles orientalis* L.  
Корабовур  
Black — billed Sandgrouse
26. Саджа — *Syrrhaptes paradoxus* Pall.  
Сувбул дурук  
Pallas's Sandgrouse
27. Серая неясыть — *Strix aluco* L.  
Пунгкуш  
Tawny Owl
28. Саксаульная сойка — *Podoces panderi* Fisch.  
Хужасавдогар  
Pander's Ground
29. Расписная синичка — *Leptopoeile sophiae* Sev.  
Гулдор читтак  
Severtzov's Tit-Warbler
30. Райская мухоловка — *Terpsiphone paradisi* L.  
Узун куйрук  
Paradise Flycatcher
31. Синяя птица — *Myophonus caeruleus* Zar.  
Тор майна  
Whistling Thrush
32. Белоножка — *Microcichla scouleri* Vig.  
Ок оек  
Little Forktail
33. Пустынный воробей — *Passer simplex* Licht.  
Чул чимчуги  
Desert Sparrow

The list of specially protected bird species includes those registered in the Red Book of IUNP as vulnerable

(white-headed duck, lesser white — fronted goose), rare (white — tailed eagle, Pallas' sea eagle, lesser kestrel, sociable lapwing, shipe — billed godwit), and insufficiently studied (red — breasted goose, slender — billed curlew). White — tailed eagle, peregrine falcon, Siberian crane, and slender — billed curlew are included into the Appendix I of CITES; the Appendix II lists flamingo, red — breasted goose, Bewick's swan, white — headed duck, black kite, Pallas' sea eagle, Egyptian vulture, northern hobby, merlin, lesser kestrel, common crane, demoiselle crane, great bustard, and tawny owl.

#### REPTILIA — ПРЕСМЫКАЮЩИЕСЯ — СУДРАЛУВИЮРУВЧИЛАР

1. Панцирный геккончик — *Alsophylax loricatus*
2. Геккончик Щербака — *Alsophylax loricatus szczerbaki* (Golubev et Sattarov, 1979)
3. Гладкий геккончик — *Alsophylax lactor* (Nikolsky)
4. Круглоголовка Молчанова — *Phrynocephalus mollschanowi* (Nikolsky)  
Molchanov's Toad Agama
5. Круглоголовка Саид — Алиева — *Phrynocephalus helioscopus saidalievi* (Sattarov, 1981)  
Said — Aliev's Toad Agama
6. Волкозуб поперечнополосатый — *Lycodon striatus bicolor* (Nik., 1903)  
Northern (Shaw's) Wolf Snake
7. Бойга черноголовая — *Boiga trigonatum melacephala* (Anandale, 1904)  
Common Tree Snake
8. Афганский литоринх — *Lythorhynchus ridgewayi* (Boul., 1887)

## Afgan Awl -headed Snake

Table II: Numbers of Plant And Animal Species Included into the IUCN List of Most Vulnerable Specks of Central Asia (1996)

Division	In Central Asia	In Uzbekistan
Embryophyta	74	10
Annelida phylum	4	2
Class Oligochaeta	4	2
Mollusca phylum	17	10
Class Bivalvia	3	3
Class Gastropoda	14	7
Arthropoda phylum	73	24
Class Crustacea	1	0
Class Insecta- Ectoanatha	72	24
Chordata phylum		
Class Pisces	10	?
Class Reptilia	9	3
Class Aves	13	12
Class Mammalia	15(18 + subspecies)	10
Total	94	36

**List of Novertebrate Species Included into The Red Book of Uzbekistan**

Тип Кольчатые черви — Annelida	Отряд Сердцеобразные —
Класс Малощетинковые —	Cardiiformes
Oligochaeta	Corbicula sog(Lamark, 1818)
Отр. Люмбрикоморфа —	Корзинка сердцевидная
Lumbricomorpha	Юракшакли саватча
Allobophora chlorocephala (Perel, 1977)	Cordiform corbicula
Аллолобофора зеленоголовая	
	Corbicula fluminalis (O. F. Muller, 1774)
Allobophora umbrophila (Perel, 1977)	Корзинка речная
Аллолобофора тенелюбивая	Даре саватчаси
	River corbicula
Тип Моллюски — Mollusca	
Класс Двустворчатые — Bivalvia	Corbicula purpurea (Prime, 1864)
Отр. Перловицеобразные —	Корзинка пурпурная
Unioniformes	Кирмизи саватчаси
Colletopterum bactrianum (Rolle, 1896)	Purple corbicula
Бактрийская беззубка	
Бактрия тишсизи	Класс Брюхоногие — Gastropoda
Bactria freshwater pearl mussel	Отряд Литторинообразные —
	Littoriniformes
Colletopterum sogdianum (Kobelt, 1897)	Sogdamnicola shadini (Izzatullaev, 1984)
Согдийская беззубка	Согдийская ключевая затворка
Сутд тишсизи	Жадина
Sogd freshwater pearl mussel	Жадин сутд булок чиганоки
	Zhadin's sogd horatid snail
Colletopterum kokandicum	
(Starobogatov et Izzatullaev, 1980)	Valvatamnicola archangelskii (Shadin, 1952)
Кокандская беззубка	Ключевая затворка Архангельского
Кукон тишсизи	Архангельский булок чиганоки
Kokand freshwater pearl mussel	Arkhangelsky's horatid snail



- Valvatamnicola schahimardanica*  
 (Izzatullaev, 1984)  
 Шахимарданская ключевая затворка  
 Шохимардон булок чиганоки  
*Shakhimardan horatid snail*
- Отр. Церитообразные –  
*Cerithiiformes*  
*Melanoides kainarensis* (Starobogatov et  
 Izzatullaev, 1980)  
 Кайнарский меланоидес  
 Кайнар меланоидеси  
*Kainar horn shell*
- Отр. Геофилы – *Geophila*  
*Gastrocopta huttoni* (Benson, 1849)  
 Гастрокопта Хаттона  
 Хаттон гастрокоптаси  
*Hutton's vertiginid snail*
- Laevozebrina urgutensis* (Kobelt, 1902)  
 Левозебрина ургутская  
 Ургут левозебринаси  
*Urgut buliminid snail*
- Тип Членистоногие – *Arthropoda*  
 Класс Паукообразные – *Arachnida*  
 Отряд Пауки – *Aranei*  
*Lathrodectus dahli* (Levi, 1959)  
 Каракурт Даля  
 Даль коракурти  
*Dahl's black widow*
- Отр. Стрекозы – *Odonata*  
*Anormogomphus kiritshenkoi* (Bartencv,  
 1913)  
 Лестодедка Кириченко  
 Кириченко ниначиси  
*Kirichenko's club-tailed dragonfly*
- Отр. Полужесткокрылые – *Hemiptera*  
*Reduvius fedtschenkianus* (Osh., 187 1)  
 Редувий Федченко  
 Федченко йирткичча  
*Fcdchenko assassin bug*
- Stenolemus bogdanovi* (Oshanin, 1896)  
 Стенолемус Богданова  
 Богданов йирткичча  
*Bogdanov's assassin bug*
- Reduvius christophi* (Jakovlev, 1902)  
 Редувий Кристофа  
 Кристоф йирткичча
- Christoph assassin bug*
- Отр. Жесткокрылые – *Coleoptera*  
*Callisthenes glasunovi* (Semenov, 1900)  
 Красотел Глазунова  
 Глазунов чиройлитанли  
*Glasunov's beauty ground beetle*
- Carabus zarudnyi* (Semenov et Znojko,  
 1932)  
 Жужелица Зарудного  
 Зарудний ташколи  
*Zarudniy's ground beetle*
- Carabus sogdianus* (Semenov, 1898)  
 Согдийская жужелица  
 Сугд ташколи  
*Sogd ground beetle*
- Anthia mannerheimi* (Chaudoir, 1842)  
 Антия  
 Антия  
*Anthia*
- Scarites turkestanicus* (Heyden, 1884)  
 Скарит туркестанский  
 Туркестон скарити  
*Turkestan scarit*
- Eurythyrea oxiana* (Semenov, 1895)  
 Золотистая тугайная златка  
 Тилларанг тугай тиллакунгизи  
*Golden tugay buprestid*
- Pisterotarsa kiritschenkoi* (Semenov,  
 1940)  
 Джаркурганская шаровидная  
 чернотелка  
 Жаркургон шарсимон коракунгиз  
*Jarkurgan spherical darkling beetle*
- Lethrus bispinus* (B. Jakovlev, 1899)  
 Кравчик ферганский  
 Фаргона кескур  
*Fergana lcthrus*
- Отр. Чешуекрылые – *Lepidoptera*  
*Laothoe philerema* (Djakonov, 1923)  
 Туранговый бражник  
 Туранга арвохкапалаги  
*Turanga sphinx*
- Sphingonaepiopsis kuldjaensis* (Graeser,  
 1892)

Бражник кульджинский Кулжа арвохкапалаги Kuldja sphinx	Глауконома Desert white
Rethera komarovi (Christoph, 1885) Бражник Комарова Комаров арвохкапалаги Komarov's sphinx	Elphinstonia tomiris (Christoph, 1884) Томирис Томирис Tomiris white
Proserpinus proserpina (Pallas, 1772) Бражник прозерпина Прозерпина арвохкапалак Proserpina sphinx	Zegrus pyrothoe (Eversmann, 1832) Зегрис пламенный Елкили serpac Flaming orange tip
Paraglyphisia oxiana (Djakonov, 1927) Хохлатка тугайная Тукай кокилдор Tugay prominent moth	Karanasa hoffmanni (Christoph, 1893) Сатир Гофмана Гофман сатири Hoffmann's satyr
Streblote finae (Gerasimov, 1931) Туранговый коконопряд Туранга пиллакаши Turanga lappet moth	Melitaea acraeina (Staudinger, 1886) Шашечница — акреина Акреина катак гулли капалак Acraeina checker spot
Catocala optima (Staudinger, 1888) Туранговая орденская лента ТураHра нишон тасмаси Turanga underwing moth	Tomares callimachus (Eversmann, 1848) Каллимах Каллимах Callimach blue
Catocala timur (A. Bang — Haas, 1907) Орденская лента Тимур Темур нишон тасмаси Timur underwing moth	Glaucopsyche charibdis (Staudinger, 1886) Голубянка тугайная Тукай феруза Tugay blue
Catocala remissa (Staudinger, 1891) Тугайная орденская лента Тукай нишон тасмаси Tugay underwing moth	Отр. Двукрылые — Diptera Chrysotoxum kozhevnikovi (Smirnov, 1924) Журчалка Кожевникова Кожевников гингпашша Kozhevnikov's flower-fly
Zygaena ferganae (Sheljuzhko, 1941) Пестрянка ферганская Фаргона олачипор Fergana smoky moth	Heringia senilis (Sack, 1938) Журчалка — герингия Герингия гингпашша Hering's flowerfly
Papilio alexanor (Esper, 1793) Алексанор Алексанор Alexanor swallowtail	Eumerus ferulae (Stackelberg, 1965) Ферульная журчалка Ферула гингпашша Ferula flowerfly
Pontia glauconome (Klug, 1929) Глауконома	

### Endemics of Terrestrial Vertebrate Fauna of Uzbekistan

The territory of Uzbekistan is an indispensable region for variety of

endemic species of Central Asian origin. Several of such species originated and evolved in the area between Amudarya and Syrdarya rivers spreading into other regions of Central Asia.

As of today, complex of vertebrate animals of Uzbekistan and Central Asia is represented by 53 species and subspecies (table jj) constituting 9.2% of total fauna composition. Various systematic groups have different numbers of endemics (table kk). The highest numbers of endemics are found among reptiles, mammals, and, to a less extent, birds. and somewhat less-birds.

Table JJ: Endemism Rate of Terrestrial Vertebrate Fauna of Uzbekistan

Class	Number of species/sub-species		% of total
	Total	Endemics	
Reptiles - Reptilia	58	30	51.7
Birds - Aves	424	a	1.8
Mammals - Mammalia	97	15	15.4
Total	579	53	9.2

Table KK: Fauna Species Endemic in Uzbekistan and Central Asia

Order	Family		
	Genera	Species (sub-species)	Habitat
Reptiles			
Testudines	Testudinidae		
	Agrionemys	Agrionemys horsfieldi (Gray, 1844)	Uzbekistan, Tadjikistan, Kazakhstan, Kyrgyzstan, Turkmenistan, Iran
Squamata	Phrynocephalus	Phrynocephalus helioscopus saidalievi (Sattorov, 1981)	Uzbekistan, Tadjikistan, Kyrgyzstan
		Phrynocephalus moltschanovi (Nikolsky, 1913)	N. Uzbekistan, Kazakhstan, N. Turkmenistan
		Phrynocephalus mystaceus mystaceus (Pallas, 1776)	Uzbekistan, S. Kazakhstan, Turkmenistan, S. Tadjikistan, NE. Iran, N Iran
		Phrynocephalus interscapularis (Lichtenstein, 1656)	Uzbekistan, NE. Iran, N. Afghanistan, Turkmenistan, S. Kazakhstan
		Phrynocephalus reticulatus reticulatus (Eichwald, 1831)	Uzbekistan, Turkmenistan
		Phrynocephalus rossikowi (Nikolsky, 1899)	N. Uzbekistan, N. Turkmenistan
		Phrynocephalus raddei (Aoettger, 1888)	S. Uzbekistan, S. Turkmenistan, SW Tadjikistan
		Phrynocephalus sogdianus (Cernov, 1948)	S. Uzbekistan, SW. Tadjikistan, N. Afghanistan
		Phrynocephalus strauchi (Nikolsky, 1905)	Fergana valley

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Order	Family		
	Genera	Species (sub-species)	Habitat
	Stellio	Stellio lechmanni (Strauch, 1896)	Uzbekistan, Turkmenistan, Tadjikistan
	Gekkonidae		
	Alsophylax	Alsophylax laevis (Nikolsky, 1907)	Uzbekistan, S. Turkmenistan, S. Tadjikistan
		Alsophylax loricatus loricatus (Strauch, 1887)	Feragana valley
	Crossobamon	Crossobamon eversmanni (Wiegmann, 1834)	Uzbekistan, Tadjikistan, S. Kazakhstan, Turkmenistan, N. Iran, N.
	Cyrtopodion	Cyrtopodion fedtschenkoi (Strauch, 1887)	Uzbekistan, E. Turkmenistan, W. Tadjikistan, N Iran, N.
	Teratoscincus	Teratoscincus scincus scincus (Schlegel, 1858)	Uzbekistan, S. Kazakhstan, Tadjikistan, Turkmenistan, E. Iran, N. Afghanistan, N. Pakistan
		Teratoscincus c. rustamowi (Szczerebak, 1979)	Fergana valley
	Eremias	Eremias regeli (Bedriaga 1905)	S. Uzbekistan, SE. Turkmenistan SW. Tadjikistan, N. Afghanistan
		Eremias nikolskii (Bedriaga, 1905)	Uzbekistan, Kyrgyzstan, Tadjikistan, Kazakhstan
		Eremias nigrocellata (Nikolsky, 1896)	S. Uzbekistan, SW. Tadjikistan, SE. Turkmenistan, NE Afghanistan. NE. Iran
		Eremias lineolata (Nikolsky, 1896)	Uzbekistan, Turkmenistan, S. Kazakhstan, SW. Tadjikistan, NE. Iran
		Eremias intermedia (Strauch, 1876)	Uzbekistan, Tadjikistan, Turkmenistan, Kazakhstan, NW Iran
		Eremias grammica (Lichtenstein, 1823)	Uzbekistan, Kazakhstan, Tadjikistan, Kyrgyzstan, Turkmenistan, N. Afghanistan, NE. Iran
		Eremias scripta lasdini (Tsarevsky, 1819)	SE. Uzbekistan, SW. Tadjikistan
		Eremias scripta pherganensis (Szczerebak et Washetko, 1973)	Fergana valley
		Eremias arguta uzbekistanica (Cernov, 1934)	Uzbekistan, Kyrgyzstan
	Scincidae		
	Ablepharus	Ablepharus deserti (Strauch, 1868)	Uzbekistan, Tadjikistan, Kyrgyzstan, Kazakhstan
	Asymblepharus	Asymblepharus alaicus yakovlevae	Uzbekistan, Kyrgyzstan, Tadjikistan

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Order	Family		
	Genera	Species (sub-species)	Habitat
		(Jeriomtschenko, 1983)	
	Viperidae		
	Echis	Echis multisquamatus (Cherlin, 1981)	Uzbekistan, Turkmenistan, NE. Iran
	Vipera	Vipera lebetina turanica (Cernov, 1940)	Uzbekistan, SE. Turkmenistan, Tadjikistan, N Afghanistan
		Vipera lebetina chernovi (Szczerbak et Chikin, 1992)	Uzbekistan, Turkmenistan, N Iran
Birds			
Ciconiformes	Ciconidae		
	Ciconia	Ciconia ciconia asiatica (Sevztov, 1872 (1873))	Uzbekistan, China
Galliformes	Phasianidae		
	Phasianus	Phasianus colchicus zarudnyi (Buturlin, 1904)	Uzbekistan, Turkmenistan
		Phasianus colchicus bianchii (Buturlin, 1904)	Uzbekistan, Tadjikistan
		Phasianus colchicus chrysomelas (Severtzov, 1875)	Uzbekistan, Turkmenistan
		Phasianus colchicus schanicus (Tarnovski, 1891)	Uzbekistan, Tadjikistan
		Phasianus colchicus turkestanicus (Lorenz, 1896)	Uzbekistan, Kazakhstan
Phasianus colchicus mongolicus (Brandt, 1844)		Uzbekistan, Kyrgyzstan, Kazakhstan	
Passeriformes	Corvidae		
	Podoces	Podoces panderi (Fischer, 1821)	Uzbekistan, Turkmenistan, Kazakhstan
Mammals			
Chiroptera	Rhinolophidae		
	Rhinolophus	Rhinolophus bocharicus Kastschenko et Akomov, 1917	Turkmenistan, Uzbekistan, N. Afghanistan
Lagomorpha	Lagomidae		
	Ochotona	Ochotona rutila (Severtzov, 1873)	Uzbekistan, Kazakhstan, Tadjikistan, Kyrgyzstan
Rodenta	Sciuridae		
	Permophilopsis	Spemophilopsis leptodactylus (Lichtenstein, 1923)	Uzbekistan, Kazakhstan, Turkmenistan, N. Iran, Afghanistan
	Citellus	Citellus relictus (Kaschkarov, 1923)	Uzbekistan, Kazakhstan, Kyrgyzstan, Tadjikistan
	Marmota	Marmota menzbieri (Kaschkarov, 1925)	Uzbekistan, Kazakhstan
	Dipodidae		

## DRAFT

Order	Family		
	Genera	Species (sub-species)	Habitat
	Salpingotus	Salpingotus heptneri (Vorontzov et Smirnov, 1969)	Uzbekistan, Kazakhstan (SW. part)
	Allactaga	Allactaga severtzovi (Vinogradov, 1925)	Uzbekistan, Kazakhstan, Tadjikistan
		Allactaga bobrinskii (Kolesnikov, 1937)	Uzbekistan, Turkmenistan, Kazakhstan
	Paradipus	Paradipus ctenodactylus (Vinogradov, 1929)	Uzbekistan, Turkmenistan
	Jaculus	Jaculus turcmenicus (Vinogradov et Bondar, 1949)	Uzbekistan, Turkmenistan
	Eremodipus	Eremodipus lichtensteni (Vinogradov, 1927)	Uzbekistan, Turkmenistan, Kazakhstan
Artiodactyla	Cervidae		
	Cervus	Cervus elaphus bactrianus (Lydekker, 1900)	Uzbekistan, Turkmenistan, Tadjikistan
	Bovidae		
	Ovis	Ovis ammon cycloceros (Hutton, 1842)	Uzbekistan, Turkmenistan
		Ovis ammon severtzovi (Nasonov, 1914)	Uzbekistan
Ovis ammon bocharensis (Nasonov, 1914)		Uzbekistan, Turkmenistan, Tadjikistan	

## Existing Provisions of Biodiversity Conservation and Sustainable Use

Table LL: Protected Area Statistics

BY TYPE							
Category	IUCN Cat.	Name	km <sup>2</sup>	%	Oblast	Man.	Eco.
Biosphere Reserve	I	Chatkal	451.55		Tashkent	SN	M
<b>Total</b>			<b>451.55</b>	<b>2</b>			
National Park	II	Zaamin Peoples Park	241.1		Djizak	SF	M
National Park	II	Ugam-Chatkal	5746		Tashkent	SF	M
<b>Total</b>			<b>5,987</b>	<b>29</b>			
Zapovednik	I	Gissar	814.38		Kashkadarya	SN	M
Zapovednik	I	Badai-Tugai	64.62		Karakalpakstan	SF	T
Zapovednik	I	Zaamin	268.4		Djizak	SF	M
Zapovednik	I	Kyzilkum	101.41		Khorezem/Bukhara	SF	T
Zapovednik	I	Zarafshan	23.5		Samarkand	SF	T
Zapovednik	I	Nuratin	177.5		Djizak	SF	M
Zapovednik	I	Surkhand	276.77		Surkhandarya	SF	M
Geological Reserve	IV	Kitab	53.78		Kashkadarya	Geolog	M
<b>Total</b>			<b>1780.1</b>	<b>9</b>			
Zakasnik	IV	Saigachyi	10000		Karakalpakstan	SN	D
Zakasnik	IV	Sodochi	500		Karakalpakstan	SN	W
Zakasnik	IV	Karakul	100		Karakalpakstan	SN	D
Zakasnik	IV	Karakir	300		Karakalpakstan	SN	D/W
Zakasnik	IV	Sarmysh	25.2		Karakalpakstan	SN	M
Zakasnik	IV	Koshrabad	165		Samarkand	SN	D

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Zakasnik	IV	Karnabchul	400		Samarkand	SN	D
Zakasnik	IV	Dengizkul	86		Bukhara	SN	D
Zakaznik	IV	Arnasai Lake	633		Djizak	Fish	W
<b>Total</b>			<b>12,209.2</b>	<b>60</b>			
Natural Monument	IV	Yazyavan	31.86		Fargana Vally	SN	D
Natural Monument	IV	Vardanz	3		Bukhara	SF	D
Breeding Reserve	IV	Ecocentre Djeiran	51.45		Bukhara	SN	D
<b>Total</b>			<b>86.1</b>				
BY OBLAST							
Natural Monumen	IV	Vardanzv	3		Bukhara	SF	D
Breeding Reserve	IV	Ecocentre Djeiran	51.45		Bukhara	SN	D
Zakasnik	IV	Dengizkul	86		Bukhara	SN	D
Zakasnik	IV	Karakul	100		Karakalpakstan	SN	D
Zakasnik	IV	Karakir	300		Karakalpakstan	SN	D/W
<b>total</b>			<b>540.5</b>	<b>3</b>			
National Park	II	Zaamin Peoples Park	241.1		Djizak	SF	M
Zapovednik	I	Zaamin	268.4		Djizak	SF	M
Zapovednik	I	Nuratin	177.5		Djizak	SF	M
Zakaznik	IV	Arnasai Lake	633		Djizak	Fish	W
<b>total</b>			<b>1320</b>	<b>6</b>			
Natural Monument	IV	Yazyavan	31.9		Fergana Vally	SN	D
<b>total</b>			<b>31.9</b>				
Zapovednik	I	Badai-Tugai	64.62		Karakalpakstan	SF	T
Zakasnik	IV	Saigachyi	10000		Karakalpakstan	SN	D
Zakasnik	IV	Sodochi	500		Karakalpakstan	SN	W
<b>total</b>			<b>10,564.6</b>	<b>5 2</b>			
Zakasnik	IV	Sarmysh	25.2		Navoi	SN	M
<b>total</b>			<b>25.2</b>				
Zapovednik	I	Gissar	814.4		Kashkadarya	SN	M
Geological Reserve	IV	Kitab	53.8		Kashkadarya	Goelogy	M
<b>total</b>			<b>868.2</b>	<b>5</b>			
Zapovedntk	I	Kyzilkum	101.4		Khorezem/Bukhara	S F	T
<b>total</b>			<b>101.4</b>				
Zapovednik	I	Zarafshan	23.6		Samarkand	SF	T
Zakasnik	IV	Koshrabad	165		Samarkand	SN	D
Zakasnik	IV	Karnabchul	400		Samarkand	SN	W
<b>total</b>			<b>588.6</b>				
Zapovednik	I	Surkhandarya	276.77		Surkhandarya	SF	M
<b>total</b>			<b>276.77</b>	<b>3</b>			
Biosphere Reserve	I	Chatkal	451.55		Tashkent	SN	M
National Park	II	Ungam-Chatkal	5746		Tashkent	SF	M
<b>total</b>			<b>6197.55</b>	<b>30</b>			
BY ECOTYPE							
Zakasnik	I V	Saigachyi	10000		Karakalpakstan	SN	D
Zakasnik	IV	Karakul	100		Karakalpakstan	SN	D
Zakasnik	IV	Koshrabad	165		Samarkand	SN	D
Zakasnik	I V	Karnabchul	400		Samarkand	SN	D
Zakasnik	IV	Dengizkul	86		Bukhara	SN	D
Natural Monument	IV	Yazyavan	31.9		Fargana Vally	SN	D
Natural Monument	IV	Vardanz	3		Bukhara	SF	D
Breeding Reserve	IV	Ecocentre Djeiran	51.5		Bukhara	SN	D
<b>total</b>			<b>110837.4</b>	<b>53</b>			

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Zakasnik	IV	Karakir	300	1	Karakalpakstan	SN	D/W
Bioshere Reserve	I	Chatkal	451.6		Tashkent	SN	M
National Park	II	Zaamin Peoples Park	241.1		Djizak	SF	M
National Park	II	Ungam-Chatkal	5746		Tashkent	SF	M
Zapovednik	I	Gissar	814.4		Kashkadarya	SN	M
Zapovednik	I	Zaamin	1268.4		Djizak	SF	M
Zapovednik	I	Nuratin	177.5		Djizak	SF	M
Zapovednik	I	Surkhand	276.77		Surkhandarya	SE	M
Zakasnik	IV	Sarmysh	25.2		Karakalpakstan	SN	M
Geological Reserve	IV	Kitab	53.78		Kashkadarya	Goelog	M
<b>total</b>			<b>8054.75</b>	<b>39</b>			
Zapovednik	I	Badai-Tugai	64.62		Karakalpakstan	SF	T
Zapovednik	I	Kyzilkum	101.41		Khorezem/Bukhara	SF	T
Zapovednik	I	Zarafshan	23.6		Samarkand	SF	T
<b>total</b>			<b>189.63</b>				
Zakasnik	IV	Sodochi	500		Karakalpakstan	SN	W
Wildfowl Reserve	IV	Arnasat	633		Djizak	F i s h	W
<b>total</b>			<b>1133</b>	<b>6</b>			
<b>BY MANAGEMENT</b>							
Zakaznik	IV	Arnasai	633	3.7	Djizak	Fish	W
Geological Reserve	IV	Kitab	53.78	0.3	Kashkadarya	Goelog	M
National Park	II	Zaamin Peoples Park	241.1		Djizak	SF	M
National Park	II	Ungam-Chatkal	5746		Tashkent	SF	M
Zapovednik	I	Badai-Tugai	64.6		Karakalpakstan	SF	T
Zapovednik	I	Zaamin	1268.4		Djizak	SF	M
Zapovednik	I	Kyzilkum	1101.4		Khorezem/Bukhara	SF	T
Zapovednik	I	Zarafshan	1236		Samarkand	SF	T
Zapovednik	I	Nuratin	177.5		Djizak	SF	M
Zapovednik	I	Surkhand	276.7		Surkhandarya	SF	M
Natural Monument	IV	Vardanzhy	3		Bukhara	SF	D
Bioshere Reserve	II	Chatkal	1451.55		Tashkent	SN	M
Zapovednik	I	Gissar	814.3		Kashkadarya	SN	M
Zakasnik	IV	Saigachyi	100003	33	Karakalpakstan	SN	7D
Zakasnik	IV	Sodochi	500		Karakalpakstan	SN	W
Zakasnik	IV	Karakul	100		Karakalpakstan	SN	D
Zakasnik	IV	Karakir	300		Karakalpakstan	SN	D/W
Zakasnik	IV	Sarmysh	25.2		Karakalpakstan	SN	M
Zakasnik	IV	Koshrabad	165		Samarkand	SN	D
Zakasnik	IV	Karnabchul	400		Samarkand	SN	D
Zakasnik	IV	Dengizkul	86		Bukhara	SN	D
Natural Monument	IV	Yazyavan	31.8		Fargana Vally	SN	D
Breeding Reserve	IV	Ecocentre Djeiran	51.4		Bukhara	SN	D
<b>Total</b>			<b>12925.44</b>	<b>63</b>			

Table MM: Financing and Staff of Two Examples of Protected Areas and Assesed Needs for *Additional Resources*

Budget Line	Staff	Funds( \$US)	Balance
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	Existing	Required	Allocated	Required	
Chatkal Biosphere Reserve					
Administration	10	10	3000	3000	–
Research Unit	14	24	3500	6500	3000
Inspection	34	34	8500	8500	–
Technical/Economic Unit	17	18	3000	21000	3000
Total	75	86	18000	21000	3000
Gissar State Reserve					
Administration	4	10	1250	3000	1750
Research Unit	8	24	2100	6400	4300
Inspection	38	45	9350	11000	16.50
Technical/Economic Unit	13	18	1900	3000	1100
Total	63	97	14600	23400	8800

Table NN: Staff And Financing of Zapovedniks and National Parks Supervised by The State Committee for Forestry of Uzbekistan Republic

Protected territory	Staff		Financing (000 sums)	
	inspection	Scientific division	Inspection	Scientific division
Zaamin People's Park	16	5	44.0	17.5
Ugam-Chatkal National Park	49	5	133.0	17.5
Surkhan zapovednik	28	4	69.0	12.0
Nurata zapovednik	29	4	63.5	14.0
Zaamin zapovednik	12	3	32.0	10.5
Kyzylkoum zapovednik	10	3	27.0	10.0
Zarafshan zapovednik	9	4	23.5	14.0
Total*	153	28	391.5	99.5

\*Increasing total inspection staff up to 230 people and inspector salaries-by 3.5 to 4 times (to make them 5.500 to 6.000 sums a month) are needed. Scientific units need their total staff expanded to 50 people and funds increased up to 750.000 sums.

Table OO: Quotas of 1995 – 96 for Hunting Wild Animals

Animal	Quota of 1996	Actually bagged in 1996	Quota of 1997
bear	-	-	6
wild boar	100	100	150
mountain goat	50	20	100
wild goat	10	5	10
saiga(k) [?]	10	-	for scientific goals
badger	500	20	300
porcupine	500	40	100
hare	5,000	2,000	3,000
fox	2,000	1,000	2,000
red marmot	-	-	upon submitting survey data
waterfowl	100,000	45,000	80,000
'keklik' [?]	5,000	2,000	3,000
pheasant	500	400	500

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'ular' [?]			50
pigeon_group	200,000	100,000	200,000
'gourza' ( <i>Vipera lebetina</i> )	1,000	150	for applications from the Academy of Sciences and other organisations
'efa' ( <i>Echis</i> )	150	100	ditto
poisonous nonvertebrates	300,000	10,000	ditto

Table PP: Prices and Indexes of Licenses (Permissions) to Hunt *Animals* and Catch Fish on the Territory of *Uzbekistan Republic*

Minimal Legal salary reference		Prices for bagging wild animals and catching fish of any gender and age		
In effect from (date).	Salary (soums)	Minimal legal salary factor		For foreign citizens; (\$US)
		Commercial, sport, and other alike goals	Scientific goals	
1.09. 2995	250			
104. 7996	400			
1.09. 1996	550			
1 12. 1996	600			
<b>MAMMALS</b>				
Registered in the Red Book:				
a) cheetah, leopard, striped hyena		100	100	5000
b) markhor		80	80	3000
c) Severtsov ural, Tien Shan ram		50	50	2000
d) Oustourt (Ustyurt) mufflon, tadjik ram		50	50	1000
e) Buckara deer, Tien Shan brown bear		50	50	1500
f) Goitred gazelle, 'perevyazka' [?]		20	20	350-300
g) Central Asian otter, Turkestani lynx, caracal, manul, Menzbier marmot, honey badger		50	50	500
Game species:				
mountain goat		2.0	0.5	500-400
wild boar		2.0	0.5	300-200
saiga(k) [?]		0.1	0.05	250-200
wild goat		1.0	0.2	120-100
stone marten, marsh-otter, red marmot, ermine		0.5	0.1	50
musk-rat		0.03	0.03	50
fox, korsak [?], jackal, wild cats, steppe polecat		0.3	0.05	20
wolf				75
badger, porcupine		0.05	0.01	10
hare-'tolay', weasel		0.02	0.01	2
hedgehogs, bats		0.01	0.005	0.2
other mammals except those negatively affecting agriculture, forests, or hunting or being carriers of dangerous infection		0.001	0.001	0.01
<b>BIRDS</b>				
Registered in the Red Book:				
a) barbary falkon, sfker falkon, peregrine falcon (the of price a bagged example is determined by special agreement within the range of \$5,000 to 20,000)		100	10	1000
b) swans, pelicans, sea eagles, snow vulture, storks, flamingo, osprey, great bustard, booted eagle, imperial eagle, steppe eagle, bearded vulture, golden eagle, Bonell's eagle, short-toed eagle, houbra bustard, little bustard		20	5	200
c) pin-tailed sandgrouse, marbeled teal, white-headed duck, other species				
Species forbidden to hunt for:				
cranes, herons, eagle owl, other birds of prey, white spoonbill, glossy ibis, great black-headed gall		3	1	30
Game species:				

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Minimal legal salary reference	Prices for bagging wild animals and catching fish of any gender and age		
pheasant	0.05	0.05	5
'ular'	0.02	0.01	10
geese	0.02	0.01	5
ducks, teals, coot, partridges (willow grouses ), black-billed sandgrouse, sandzha	0.01	0.005	0.5
pigeons, turtle-doves, stints, cormorants, 'poganka's, 'kamyshnitsa', quail, bitterns, 'krohal's	0.005	0.001	0.3
song-birds	0.02	0.005	0.5
other bird species	0.003	0.001	0.2
REPTILES			
Registered in the Red Book:			
a) cobra, desert monitor	10	5	1000
b) other rare species	5	2	50
'efa' ( <i>Echis</i> ), 'shitomordnik', viper, 'gourza' ( <i>Vipera lebetina</i> )	1	1	100
nonpoisonous snakes	0.1	0.05	5
tortoise	0.02	0.01	2
'yashourka' ( <i>Eremias</i> ), gecko, lizards, 'agama' ( <i>Agamidae</i> ), other species	0.01	0.005	1
AMPHIBIA			
frogs, toads	0.005	0.001	0.1
FISH			
Registered in the Red Book:			
Aral barbel, 'ship' (bastard sturgeon), shovelnoses and other species	3		100
Market species:			
sheat-fish, herbivorous fishes, wild carp, chub, Issyk-koul trout, 'pelyad" , flat-fish, Turkestani barbel, 'marinka'	0.3/0.05	0.02	5
pike-perch, carp, crucian, Samarkand 'khramulya' , 'zmeyegolov' , bream, pike, 'chelon' shemaya' , vobla ( <i>Caspian roach</i> ), roach, kutuom	0.2/0.03	0.01	2
'beloglazka' , 'krasnoperka', and othe low-value species	0.1/0.01	0.005	1
Note: License prices for catching fish are indicated in the following format: the second column: numerator— for commercial goals per 1 centner, denominator—per each kg exceeding the [free] limit for sport/pleasure goals; the third column: per an example.			
NONVERTEBRATES			
registered in the Red Book of Uzbekistan	1	0.05	30
poisonous nonvertebrates	0.01	0.005	1
river crayfish	0.005	0.001	0.3
other cancroids (per 1 kg)	0.02	0.01	0.5
other nonvertebrates except those negatively affecting agriculture, forests, or hunting or being carriers of dangerous infection	0.002	0.001	0.1
mummy [black sticky stuff] (per 1 g)	0.005	0.005	0.25
Bagging wild animals for medical purposes (carriers of dangerous deseases of humans and animals) is free. Prices in \$US (in the forth column), where appropriate: the first figure-for one animal, the second-for every consequent example.			
License prices for breeding, reproduction, and introducing purposes are decreased by 5 times.			
License prices for animals bagged for furs-stone marten, marsh-otter, red marmot, ermine, musk-rat, fox korsak [?], jackal, wild cats, steppe polecat, hare, and weasel-are 50% of regular prices for sport and pleasure aoads.			