

III

ACTION PLAN ON CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY

The problem of biodiversity conservation and sustainable development of ecological systems and biosphere as a whole, is considered one of the global problems of both environmental protection and sustainable development of the country economy. The worsening state of biodiversity is catastrophic for biosystems at the genotypic, biospecies, and population levels, and for the human life, on the whole. This leads to systematic extinction of plant and animal species on the regional and global scale, air pollution, global climate warming, outbreaks of many infectious diseases, and weakening of nature resistance to external affects.

The international political transformations and socio-economic crisis in many countries of the world made the problem of biodiversity conservation acute and the situation unstable.

Rare local measures, no matter how active they are, will not add much to combating biodiversity degradation. The sustainable and radical management of natural resources and the quantitative and qualitative environmental protection are not possible without scientific methods used for studying natural and anthropogenic impact on biodiversity. The conservation and sustainable management of biodiversity is impossible without developing clearly operating planning system and implementing new plans.

The Action Plan includes practical actions, which are to be taken within each Strategy component, to reach the purposes and objectives set. These actions are subdivided into a number of successive and interrelated activities. Some of the below listed actions will be carried out according to the existing plans and projects. Corrections are supposed to be made in the order and volume of various kinds of work on realizing the plan and the Strategy purpose. All the activities are designed to provide effective implementation, with an approximate budget, terms of implementation, and expected results being indicated.

The plan of primary actions on natural resource conservation and biodiversity sustainable management and restoration is developed ac-



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According to the requirements of the Convention on Biological Diversity and the National Strategy of Republic of Tajikistan. It should be interrelated with the national strategies and action plans on combating desertification and climate change, and the State Ecological Program.

3.1. Basic Criteria for Identifying Primary Actions

Considering the priorities of the National Strategy on Biodiversity Conservation and Sustainable Management, the Action Plan is to fulfill the primary tasks: reinforcing conservation of vulnerable diversity of plants, animals, and microorganisms, improving the management system of protected areas, which are the main factors for biodiversity conservation *in-situ*, as well as restoring destructed ecosystems and biological resources. Much attention is paid to the issues of biodiversity conservation and sustainable management *ex-situ*, including agricultural biodiversity.

The main criteria of determining the priority of particular action, included in the plan of actions on biodiversity conservation and sustainable management of its components, are:

- 1 presence of rare, endemic, relic, and economically valuable biodiversity components;
- 2 need of inventorying lacking components of biodiversity;
- 3 high vulnerability of biodiversity components to external affects;

- 4 high resource and economic value of biodiversity, conservation regimes being provided;
- 5 rich genetic resources of wild relative species of cultivated plants and domestic animals;
- 6 need of approving and improving the laws and regulations on biodiversity conservation and sustainable management of its components; etc.

The Action Plan on biodiversity conservation is aimed at restoring the biological potential. At the same time, the problem of regional area structures and people settlement is to be solved in close interrelation with providing biodiversity sustainable development.

3.2. Priorities of Biodiversity Conservation

The Strategy and Action Plan envisage primarily taking measures on further development and improvement of actions. To determine the need of additional measures, procedure of evaluation, that can be applied also to new project proposals, is developed. The evaluation of the priorities was based on the list of criteria, characterizing contribution to biodiversity conservation (table 1).

The model measures can be evaluated by 10 criteria:

- 1 importance of biodiversity;
- 2 value of the project model;
- 3 success probability;
- 4 stability of results;
- 5 urgency;
- 6 possibility of further cooperation;
- 7 financial effect;
- 8 area importance for biodiversity conservation;
- 9 increasing the socio-economic importance of biodiversity for the region;
- 10 increasing social support;

Additional criteria of project selection are:

- 1 ecological value;
- 2 short-term implementation;
- 3 material and technical supply;
- 4 trained specialists, that are able to implement a project,

including those of the global value of biodiversity:

- 1 genetic value;
- 2 economic and social importance;

- 3 work implemented on the project;
- 4 connection with other ecological conventions;
- 5 access to the results, that can be used by other countries to raise the living standards of the population.
- 6 elimination of social and cultural backwardness, etc.

The primary actions, included in the Action Plan on biodiversity conservation, were determined by criteria expert evaluation and joint discussions at national and working seminars, with known scientists, specialists from the state administration, NGOs, and mass media participating.

The implementation of the Action Plan on biodiversity conservation and sustainable management in Tajikistan will result in system of well coordinated in terms and space actions, that are able both to provide the socio-economic development of the country and form valid base of combating biodiversity degradation on the global, national, and local scale.

3.3. Outline of Primary Actions on Biodiversity Conservation

The Action Plan on conservation of biological diversity is developed by methods, used in the Pan-European Biological and Landscape Diversity Strategy, comprising all levels of mechanisms of biodiversity conservation.

Each complex of measures includes actions on improving the policy, legislation, and institutional base; area planning of biodiversity, carrying out research, and monitoring; providing informational, training and educational services for the population, with terms of implementation, possible financial sources, and responsibilities for work implementation being indicated.

Further on, within the Action Plan, the central state environmental authorities and NBBC will be able to initiate concrete actions and programs to promote realizing the Strategy priorities.

Approximate budgets of the measures are given in \$US for comparison, being just an illustration. They are rough estimates of supposed expenses, that will help to raise funds necessary for each activity implementation. In some cases, one budget could be assigned to several related activities.

Terms of implementation are also approximate. It points when within five-year period each activity will be carried out, with its relative priority as compared to other activities being considered. The implementation mechanism and monitoring are provided by the existing Governmental Working Group and NBBC for the entire period of the Strategy implementation, without additional funding of new budget structures.

Special mechanism of providing biodiversity sustainable management is further working on the project and preparation of Second National Report, for the assessment of needs in capacity building on biodiversity conservation and elaboration of factors not considered during implementation of Phase 1.

3.4. General Action Plan on Biodiversity Conservation

The analysis and evaluation of biodiversity in Tajikistan showed that, despite the long-term all-round research of biodiversity by many well-known foreign specialists, the National Academy of Science, particular state and research institutions, new aspects are now revealed, which require new approach to gaining information about the biodiversity of this unique mountainous country. This approach is necessary for using international mechanisms of work organization in the

sphere of conservation and sustainable management of biological resources.

First of all, the weak links in assessing and developing plans and programs include:

- 1 lack of analytical review of information on the qualitative and quantitative state of biodiversity;
- 2 lack of methodological base of various environmental schools;
- 3 lack of common taxonomic initiative on the main components of biodiversity and ecological systems;
- 4 the imperfect political, institutional, and legislative bases on biodiversity conservation;
- 5 unstable ecological policy in evaluating biodiversity;
- 6 lack of common monitoring techniques and center for biodiversity regulation and systematization;
- 7 lack of centralized database on biodiversity;
- 8 lack of a successive stage-systematization and organization of work on biodiversity state prediction and sustainable management;
- 9 lack of biodiversity research at various ecological levels;
- 10 lack of leadership and methods of carrying out inventory and passportization of biodiversity components (even endemic and listed in the Red Data Book species, and valuable communities);



Alaudin Lake (Northern Tajikistan)

11 uncoordinated floristic, botanico-geographical, cartographical, scientific, and practical research investigations and works.

Under most complicated conditions in mountain landscapes with rich biodiversity composition and structure, diverse living forms and their habitats, the forming of numerous ecological, soil-ground, and genetic varieties is complicated by the problems of conserving and managing biological resources. In this connection, it is necessary to implement measures on biodiversity conservation at various biosystem levels according to international requirements.

The general Action Plan is aimed at solving the main actions, which provide using of complex methodology at the national level. They include primarily: reforming the current policy to reach balance between biodiversity conservation and biological resource management; developing legal tools for providing the CBD realization and raising the institutional and human potential in the sphere of biodiversity conservation, research, and monitoring; developing programs and projects; biodiversity conservation and providing necessary

terms of including it in the area planning; providing incentives for people's training and education on biodiversity conservation and sustainable management of its components; improving mechanisms of financial support of biodiversity conservation and sustainable management; developing mechanism of mediation, exchange of and access to information; monitoring and coordination of the Biodiversity Conservation Strategy implementation; international cooperation.

Measures, included in this chapter, promote stage-by-stage reorientation and improvement of the biodiversity policy and legislation on balanced development of the main biodiversity components at the biosphere, geosystem, ecosystem, and species levels. They provide alleviation of the poverty level through improving the state of biodiversity and its sustainable management.

The General Action Plan on biodiversity conservation is to be implemented in a period of 10 years, with the amount of US\$4.283,000 being required.

Table 3.4. General Action Plan on Biodiversity Conservation

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	*Improving the policy of biodiversity conservation to provide sustainable management of biological resources.	2004-2014	SB	Government, MNP
1.1.	Developing a policy, aimed at conserving biodiversity, as a national property promoting the biological security of the country.	2004-2014	SB	MNP, AS, TAAS
1.2.	Developing strategy of environment evaluation to determine biodiversity conservation and sustainable management.	2004-2009	SB, IF	MNP, AS, TAAS, SSA
1.3.	Integrating national action plans of environmental conventions and agreements on biodiversity conservation.	2004-2005	SB, IF	Government, MNP
2.	*Improving the legislative base to meet the requirements of the Convention on Biological Diversity.	2004-2007	SB, IF	Government, MNP
2.1.	Evaluating the state of national laws, concerning implementation of the Convention on Biodiversity, and developing proposals on their updating	2004-2005	SB	Government, MNP, MJ
2.2.	Conform the current national law of environmental protection with the Convention on Biodiversity.	2004-2005	SB, LM	Government, MNP, AS, MJ, TAAS
2.3.	Developing draft project on the vegetation world.	2004-2005	SB	Government, MNP, AS, TAAS
2.4.	Developing legislative base to provide biological safety.	2004-2006	SB, IF	Government, MNP, AS
3.	Developing institutional structure and raising staff capacity in the sphere of biodiversity conservation.	2004-2011	SB	Government, MNP, AS

Table 3.4. continued

1	2	3	4	5
3.1.	Using capacity of the Governmental Working Group for monitoring the Strategy implementation and coordinating measures within the frames of the Action Plan on biodiversity conservation.	From 2004 on	SB, IF	MNP, AS, NBBC, TAAS, NGO, GWG
3.2.	Organizing profile institutional unit in executive agency on developing the Strategy to coordinate the implementation of the Action Plan on biodiversity conservation and sustainable management.	2004-2005	SB	Government, MF
3.3.	Raising the potential of research institutions, providing monitoring and management of biodiversity.	2004-2009	SB, EF, IF	AS, MNP, MF
3.4.	Coordinating activities of environmental institutions to increase the efficiency of existing possibilities.	2004-2010	SB, LM, IF	MNP, AS, TAAS
3.5.	Raising the potential of organizations possessing valuable collections (plants, herbaria, living organism specimens, museum exhibits).	2004-2011	SB, LM, EF	MNP, AS, TAAS
3.6.	Introducing amendments into the institutional base of the State Forestry Department according to the principles of function division.	2004-2006	SB	Government, FE, MA
4.	Improving the management and raising the effectiveness of protected area activities.	2004-2009	SB	FE, MNP
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	*Developing long-term programs of research and biological monitoring.	2004-2006	SB, LM, EF	MNP, AS, NGO
2.	*Studying and evaluating the impact of climate change on biodiversity.	2004-2009	SB, IF, EF	MNP, AS, NGO
3.	Providing scientific substantiation and developing programs on mountain ecosystem restoration.	2004-2005	SB, IF, EF	MNP, AS, MA, NGO
4.	Creating database of valuable communities.	2004-2006	SB	MNP, AS, universities, NGO, TAAS
5.	Developing base for the electronic system of biological monitoring.	2004-2009	SB, IF	MNP, AS, NGO, TAAS
6.	Drawing up maps of biogeographical zones, 1:200 000 and 1:500 000, over the country.	2004-2009	EF, SB, IF	SCL, MNP, AS, NGO
7.	Developing effective measures to combat illegal mountain forest cuttings.	2004-2006	SB	FE, AS, MNP
8.	Developing and implementing the national program on forestry.	2004-2009	SB, IF	FE, MNP, NGO
9.	*Organizing and carrying out work on forest restoration in all forest categories.	2004-2011	SB, IF, EF	FE
10.	*Compiling the Red Data Book of Tajikistan (second edition).	2004-2007	SB, IF	MNP, AS
11.	Drawing up maps of the most valuable plant communities.	2004-2009	SB, EF	MNP, AS, NGO
12.	*Issuing the Green Book of Tajikistan (rare plant communities).	2004-2009	EF, SB, LM	MNP, AS
13.	Developing programs on restoring network of botanical and zoological stations.	2004-2009	SB	AS, MNP
14.	Evaluating the vegetable and animal resources and establishing limits for hunting.	2004-2007	SB	FE, MNP, AS
15.	Creating a model of biodiversity conservation and sustainable management in Central Tajikistan.	2004-2008	IF, EF	MNP, NBBC
16.	Restoring the shelter belts on the area of 1200 hectares.	2004-2009	SB	FE
17.	Restoring biodiversity in secondary degraded forests.	2004-2009	SB, LM	FE, AS
18.	Developing measures on preventing forest fires and alleviating their negative affect.	2004	SB	FE, LA
19.	Developing measures on alleviating the climate change impacts	2004	SB	AS, FE, MNP

Table 3.4. continued

1	2	3	4	5
20.	Developing measures on preventing alien and invasive species introduction.	2004-2006	SB	AS, FE, MA, MNP
21.	*Developing and implementing the national program on reconstruction of broad-leaf, juniper, flood plain, xerophytic, and light forests.	2004-2009	SB, LM	FE, AS, MNP
C. RESEARCH AND MONITORING				
1.	*Developing and implementing projects and programs on conservation and sustainable management of biological resources in the Tien Shan and Pamir-Alai transboundary mountain systems.	2004-2009	SB, GEF	MNP, AS, NBBC
2.	Improving forest management to provide valuable forest biodiversity conservation.	2004-2009	SB, IF, EF	FE, MNP, AS
3.	*Developing and implementing industrial and area action plans to conserve and restore ecosystems.	2004-2009	SB, LM	MNP, FE
4.	Developing and implementing projects on introducing and using new technologies in the sphere of biodiversity conservation.	2004-2005	SB, IF	AS, TAAS, MNP
5.	*Developing national program on restoration and sustainable management of pastures.	2004-2005	SB	TAAS, MA, AS, FE
6.	Developing project proposal on biodiversity conservation at the geosystem level.	2004-2005	SB, GEF	MNP, FE, NBBC, AS
7.	Improving the system of staff training on forestry issues.	2004-2005	SB	ME, FE
8.	Inventorizing forest ecosystems.	2004-2009	SB, IF	FE, AS, MNP
9.	Developing a typology and mapping forest ecosystems.	2004-2009	SB	AS, CGD
10.	Inventorizing medicinal plants and restoring the populations of wild food plants within the area of the State Forest Resources.	2004-2009	SB	FE, AS
11.	*Developing monitoring of the forest resources and creating informational system.	2004-2006	SB, IF	FE
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	*Developing complex program on environmental education in biodiversity.	2004-2006	SB	ME, AS, MNP, GWG
2.	Shooting videofilms and preparing advertising, educational, and other visual aids on biodiversity and ecosystems of Tajikistan.	2004-2005	SB, IF	MNP, AS, NGO
3.	Organizing conferences and seminars on biodiversity conservation and sustainable management at the national level.	2004-2008 (every 2 years)	SB, IF, EF	TAAS, AS, MNP, State Universities
4.	*Providing financial, technical, methodological, and consulting support in preparing and issuing teaching and educational, and popular scientific literature on biodiversity conservation.	2004-2010	SB, IF, EF	MF, AS, MA
5.	Organizing environmental education of the population.	2004-2009	SB, EF	MA, AS, MNP, ME
6.	Issuing map of biodiversity components (PNA and ecosystems) conservation of Tajikistan.	2005	SB, EF	MF, AS, CGD
7.	Issuing the annual newsletter "Biodiversity of the Republic of Tajikistan" (conservation, management, reproduction).	From 2004 on	SB, EF, IF	GWG, MF, MNP, AS
8.	Training and improving skills of PNA staff.	From 2004 on	SB	MNP, AS, FE
E. IMPROVING THE MECHANISMS OF FINANCIAL SUPPORT				
1.	Developing and improving the methods of economic evaluation of biodiversity conservation.	2004-2010	SB	MET, MNP, AS
2.	*Providing economic evaluation of biological resources used in the national economy.	2004-2009	SB, EF	MET, AS, TAAS, MNP
3.	Developing and improving the mechanisms of economic incentives of work on biodiversity conservation.	2004-2009	SB, LM, EF	MET, MF, AS, MNP

Table 3.4. continued

1	2	3	4	5
4.	*Searching financial support from donor countries in the sphere of biodiversity conservation.	2004-2010	EF	MNP, AS, NBBC
F. PROVIDING INFORMATION, COORDINATION, AND COOPERATION; CREATING A MECHANISM OF MEDIATION				
1.	Providing exchange of and access to information; coordinating measures on biodiversity conservation.	2004-2011	SB, LM, EF, IF	MNP, FE, AS
2.	Improving the quality of information about biodiversity conservation.	From 2004 on	SB, LM	GWG, MNP, NGO
3.	Creating a complex system of biodiversity information management.	2004-2006	SB, EF	MNP
4.	*Creating a database of flora, fauna, and microorganism biodiversity.	2004-2009	SB, EF	GWG, AS, MNP
5.	Organizing a group of experts on evaluating biodiversity.	2004-2005	SB	AS, MF, MNP, GWG
6.	Preparing report on the process of the NBSAP implementation.	From 2004 on	SB, IF	MNP, AS, NBBC
7.	Providing technical support for implementation of projects on biodiversity conservation.	2004-2006	SB, IF	NBBC
8.	Preparing thematic reports according to the requirements of the Convention on Biodiversity.	2004-2011	SB, IF	MNP, AS
9.	Preparing regular National informational report on biodiversity conservation.	2004-2009	SB, IF	MNP, AS, GWG
G. INTERNATIONAL COOPERATION				
1.	*Determining priorities of cooperation in biodiversity conservation (establishing transboundary reserves, migration passages, "green corridors", regional environmental networks, and joint environmental areas).	2004-2005	SB, IF	AS, MNP, SCL
2.	Determining trend of cooperation in biodiversity conservation according to the international requirements (conventions, agreements, programs on bilateral and multilateral cooperation).	2004-2006	SB, MN	MF, MNP, AS, TAAS
3.	*Developing national criteria, indicators, and statements to realize the requirements of environmental conventions.	2004-2005	SB, IF	AS, MNP
4.	Joining the Convention on International Trade in Endangered Species of Wild Fauna and Flora.	2004-2005	SB	MNP, FE, NBBC
5.	*Preparing the text of the Convention on Cultural and Natural Landscape Conservation in Central Asia.	2004	SB	MNP, FE
6.	*Initiating the development of Central Asian Environmental Network.	2004-2007	SB, EF	MNP, AS
7.	*Ratifying the Cartagena Protocol on Biosafety.	2004	SB	MNP, GWG
8.	Including Republic of Tajikistan in the International Center for Genetic Engineering and Biotechnology (<i>Trieste, Italia</i>).	2005-2007	SB, IF	MNP, AS, GWG

3.5. Action Plan on Creating the National Ecological Network

One of the main forms of biodiversity conservation is developing and organizing ecological network covering the most stable territories, areas, or valuable ecosystems, biocoenoses, where rare and endemic species, genetic resources of the global, regional, and national value, are accumulated. In Tajikistan, similar units occur everywhere in each region, mountain system, range, or valley.

The existing protected areas (zapovedniks, zakazniks, and national parks) do not comprise total diversity of the country, the features and contents of the main types of ecosystems, geosystems, rare and unique species, valuable communities, and their habitats. They represent 2-5% of the proportional composition of unique biodiversity. E.g., the Tigrovaya Balka Reserve contains only one ecosystem with 500 species of plants and animals, and only 0.5% of these are rare and endemic species and genetic

resources. The Romit and Dashti-Jum reserves are the same in specific diversity and ecosystems, comprising only about 2-3% of the total volume of the unique landscape diversity. The Tajik National Park, organized in the GBAO, includes only three ecosystems, two geosystems, about 600 species of plants and animals, i.e. the same can be observed in the area of small degraded zapovednik. Meanwhile, nearly 80% of unique ecosystems, the specific diversity of valuable communities within Central, Northern, and Southern Tajikistan remain beyond the boundaries of PNA and reserved zones. In view of this, measures on improving the policy, legislation, and institutional base of protected units and areas are in-

cluded in the Action Plan on biodiversity conservation at the geosystem level.

The measure plans include work on providing conceptual base for creating ecological network, developing areas, their planning, compiling many-scale, creating new elements of the ecological network, holding a number of public conferences, seminars, and trainings to involve greater number of people in the organizational process of the ecological network.

The process of preparing and realizing the measures consists of many stages; it will require 10 years, with the total amount of funds being US \$745,000.

Table 3.5. Action Plan on Creating National Ecological Network

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Developing concept of creating a national environmental network and PNA.	2004-2005	SB, IF, EF	MNP, AS, SCL
2.	Revising the boundaries and trends of existing PNA activities.	2004-2009	SB	MNP, FE, SCL, AS
3.	Conform the PNA state and functions with the international requirements and national interests.	2004-2009	SB, LM	MNP, FD, AS, SCL
4.	Establishing national center for creating a national ecological network.	2004-2005	SB, LM, EF	MNP, AS, NGO
5.	Developing national concept of organizing and creating PNA.	2004	SB, EF, IF	MNP, SCL, AS, FE
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	*Developing concept and methods of creating an ecological network.	2004-2007	SB	MNP, AS
2.	Considering the requirements of the national ecological network in the national scheme of territory planning.	From 2004 on	SB	MNP, MET
3.	Drawing up a territory map of the national ecological network (1:100 000).	2004-2006	SB	MNP, FE, AS, MET
4.	Drawing up territory maps of regional ecological networks (1:500 000).	2004-2006	SB	MNP, FE, AS, MET
5.	Developing and realizing experimental projects of local ecological networks (1:200 000).	2004-2009	SB, EF	MNP, LA
6.	Developing scheme of the national ecological network adaptation to those of the neighboring countries.	2004-2006	SB, LM	MNP, AS
C. RESEARCH AND MONITORING				
1.	Scientifically substantiating and developing program and action plan on creating a national ecological network.	2004-2009	SB, MF	MNP, AS
2.	*Determining and drawing up maps of areas to be included in the national ecological network.	2004-2006	SB, EF	MNP, AS, CGD, SCL
D. INFORMATIONAL AND EDUCATIONAL MEASURES				
1.	Issuing methods and instructions for creating a national ecological network.	2004-2007	SB	MNP, AS, NGO
2.	Creating republican museum on biodiversity.	2004-2011	SB	MNP, AS
3.	Organizing conferences.	2004	SB, IF	GWG

3.6. Action Plan on Biodiversity Conservation at the Geosystem Level

Total biodiversity of the mountainous areas of Tajikistan is mainly accumulated in various landscape zones, environmental niches, and biological zones; that is why, to implement the Action Plan, the assignment of biodiversity to geosystems should be considered.

The main criterion of natural and environmental zonation is the landscape base, so the Action Plan includes development of concept of the mountain biodiversity conservation and sustainable management. This promotes further improvement of the land legislation and the institutional base of farming, with the area planning, nature management, and environmental activity being considered at the geosystem level.

The area zonation according to environmental and landscape distribution of biodiversity is important part of the Plan; it provides conservation of rare endemic species in particular unique mountain ranges, small valleys, ecosystems, or

valuable communities, which contain considerable specific diversity of living organisms of regional and global value. Most suitable for biodiversity conservation is a large PNA zonation, with reservations being distinguished within the PNA.

The Plan section on biodiversity monitoring promotes restoration of biostations and biological resource observation points in many regions and geosystems, providing valid information and proper planning of biodiversity sustainable management.

Educational measures, concerning popularization of biodiversity conservation and sustainable management in sacred and inaccessible places, will promote observation of the Convention articles on traditional knowledge and biodiversity conservation *in-situ*. The implementation of this section involves almost all major State bodies, NGOs, and local population. It is planned for the nearest 10 years, with further good prospects. The amount of funds is approximately US\$3,995,000 for the period of the NBSAP implementation.

Table 3.6. Action Plan on Biodiversity Conservation at the Geosystem Level

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	*Developing draft law on national ecological network.	2004-2005	SB, EF	Government, MNP, AS
2.	Improving laws on land use and nature management.	2004-2009	SB, EF	Government, SCL, MNP, MA
3.	*Developing draft laws on natural monuments.	2004-2007	SB, EF	Government, MNP, FE
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Developing detailed ecological zonation of the country.	2004-2006	SB, IF, EF	MNP, AS, SCL, FE
2.	Geosystem zonation.	2004-2009	SB, LM, EF	MNP, AS, SCL, FE
3.	Landscape zonation and biodiversity.	2004-2009	SB, LM	AS, MNP, FE
4.	Analyzing the representative and adequate character of the current PNA system.	2004-2006	SB	AS, FE, MNP
5.	Creating the Mogoltau microzapovednik within the mountain range of the same name.	2004-2009	SB, LM	MNP, FE, AS
6.	Reorganizing the Aktash Zakaznik into the Boboi Ob Microzapovednik.	2004-2006	SB	FE, MNP, SCL, LKh
7.	Organizing the Shakhristan Zapovednik.	2004-2005	SB	FE, MNP
8.	Organizing and reorganizing existing PNAs into microzakazniks in the Zeravshan River Valley.	2004-2009	SB, IF, LM	MNP, FE, LKh, NGO
9.	Organizing and reorganizing PNAs into microzapovedniks and microzakazniks on the Hissar Range, in the Karatag River Valley over the Shirkent Barrier, the Varzob Gorge.	2004-2010	SB, IF, LM	MNP, AS, FE, LKh, NGO

Table 3.6. continued

1	2	3	4	5
10.	Organizing and reorganizing PNAs into microzapovedniks and microzakazniks in the Romit Gorge, the southern slopes of the Karategin, Peter the Great, and Vakhsh ranges, in the Yakhsu River Valley, and the South Tajikistan Province.	2004-2009	SB, IF	MNP, AS, FE, LKh
11.	Creating microzakazniks in the Western Pamir Mountainous System (Province).	2004-2009	SB, LM	MNP, AS, FE, LKh
12.	Creating microzakazniks in the Eastern Pamirs.	2004-2009	SB, IF, LM	MNP, AS, FE, LKh
13.	Completing work on reorganizing the Tigrovaya Balka Reserve into biosphere zapovednik.	2004-2005	SB, IF, LM	AS, FE, LKh
14.	Developing and implementing measures on afforestation of "environmental corridors" to create forest frame.	2004-2009	SB, IF, LM	FE, LKh
15.	Developing measures on valuable forest communities conservation.	2005	SB	AS, FE
16.	Developing international cooperation in providing access to ecologically secure technologies of sustainable forest management.	2004-2005	SB, IF	AS, FE, MNP
17.	Carrying out work on hunting organization in hunting farms.	2004-2006	SB, LM	MNP, FE
C. RESEARCH AND MONITORING				
1.	Restoring permanent points and biostations (Ganjina, Anzob, Shakhristan, Tashmechet, Garauty, Kabadien, etc.).	2004-2009	SB, IF	MNP, AS, MA, LKh, FE
2.	Improving and restoring zakazniks in geographical provinces: northern Tajikistan, Zeravshan, Hissar, Central Tajikistan, southern Tajikistan, the Western Pamir, and the Eastern Pamir.	2004-2009	SB, IF, LM	MEP, AS, MA, LKh, FE
3.	Developing program and action plan on organizing microzapovedniks and microzakazniks within particular provinces and PNA.	2004-2006	SB, LM	MNP, FE, AS
4.	Developing and issuing the map of some particular territorial provinces	2004-2006	SB, LM	MNP, FE
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Preparing and issuing popular scientific literature and visual aids.	2004-2009	SB, IF	MNP, NGO
2.	Organizing and holding seminars, round tables, conferences, and discussions on biodiversity conservation.	2004-2006	SB	MNP, FE, AS
3.	Shooting video film on biodiversity state in particular environmental provinces.	2004-2006	SB, LM	MNP, AS, LKh
4.	Training and improving skills of specialists.	From 2004 on	SB	MNP, LKh, ME

3.7. Action Plan on Conservation of Nival Glacier Ecosystems

The measures are aimed at conserving not numerous plants (10-15 species) and a small number of animals (50-100 species), insects, being in quite difficult living conditions and distributing over the area of more than 3 million hectares.

Despite the great areas occupied by this ecosystem, scarce species of plants and animals are still vulnerable to anthropogenic impact. That



Nival Glacier landscape

is why, special actions are aimed at regulating the tourist activity and reinforcing the regime of garbage utilization, as well as creating temporary reserves and including them in the plan of ecological network development.

Also, advertising and educational measures on involving tourists to organize international mountain-climbing activity are needed.

These actions will promote conservation of snow leopard, argali, and rare plant species. The responsibility for the implementation of some actions is placed on the local authorities, the work being coordinated by the Ministry for Nature Protection, Academy of Sciences, Ministry of Economy and Trade, etc. The amount of funds for these actions implementation for a 5 year period is US\$1,115,000.

Table 3.7. Action Plan on Conservation of Nival Glacier Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	*Developing laws on regulating tourist activity, as well as international hunting and damage compensation.	2004-2005	SB	MET
2.	Prohibiting of hunting and catching animals and gathering plants, listed in the Red Data Book.	2004-2005	SB	MNP, FE
3.	Providing legal and political substantiation for giving the world status of national heritage to high-mountain peaks and glacial knots.	2004-2006	SB	Government, MNT
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Developing plan and program of flora and fauna diversity conservation.	2004-2005	SB	AS, MNP
2.	Creating temporary reserves for conserving plant and animal species in near-glacier zones.	2004-2005	SB	MM, AS, MNP
C. RESEARCH AND MONITORING				
1.	Organizing monitoring and inventory of flora and fauna from nival glacial ecosystems of Central Tajikistan, Western and Eastern Pamirs.	2004-2009	SB, IF, EF	AS, MMWM, MNP
2.	Drawing up map of plant and animal habitats.	2004-2009	SB, IF	AS, MNP, CGD
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Issuing popular scientific literature, posters, and booklets.	2004-2006	SB	AS, MNP
E. IMPROVING THE MECHANISMS OF FINANCIAL SUPPORT				
1.	Fixing taxes for ecotourism and other activities.	2004-2008	SB	MNP, MF, MET
F. PROVIDING INFORMATION, COORDINATION, AND COOPERATION; CREATING A CLEARING-HOUSE MECHANISM				
1.	Organizing system of informing the population of negative impact on biodiversity.	From 2004 on	SB, LM	ME, MNP
G. INTERNATIONAL COOPERATION				
1.	Concluding international agreements on regulating tourism and using biological resources in recreation zones.	From 2004 on	SB	MET

3.8. Action Plan on Conservation of High Mountain Desert Ecosystems

The organization and realization of the Action Plan on this ecosystem conservation are most time-consuming, as its areas are in complicated high-mountain landscapes, with vulnerable biodiversity at all levels. The Action Plan envisages reinforcement of the legislative and institutional base and restructuring of the long-term nature management. The most important measures are: organizing monitoring of vegetable communities at the level of formations and types; restoring

the Chechekty biostation; inventorying and irrigating the pastures; developing long-term programs on studying high-mountain flora and fauna and their sustainable management. Particularly important is determining and using the genetic resources.

This work is carried out by numerous international projects and interested research organizations studying life in the high-mountain environment as a specific ecological niche for conservation of diverse life varieties, adapted to extreme conditions.

To implement these actions, the budgetary funds are not enough, so many international foundations are involved.

The total amount of funds for these measures implementation is US\$1,922,000, 20% of which is provided by the country, 80% – by inter-

national foundations of the global and regional levels, since the conservation of high-mountain desert biodiversity is of great importance for maintaining the ecological balance of the region and subregion.

Table 3.8. Action Plan on Conservation of High Mountain Desert Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	*Creating a national park in mountain-desert ecosystem. Developing regulations and building its institutional capacity.	2004-2006	SB, IF, EF, LM	MNP, AS, FE
2.	Developing regulations on buffer zones in PNA.	2004-2005	SB	MNP, FE
3.	Developing and approving standards for using pastures in mountain-desert ecosystems (regulating pasturing and gathering medicine and food plants).	2004-2005	SB	MA, FE, MNP, SCL, TAAS
4.	Undertaking adequate measures on preventing poaching.	2004-2011	SB, EF	MNP, FE
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Developing and introducing programs on restoring productivity of degraded pastures and grasslands.	2004-2012	SB, IF	MA, MNP, AS, FE, SCL, TAAS
2.	*Developing programs on restoration of teresken communities in the Pamirs.	2004-2005	SB, IF	AS, NGO
3.	Restoring the vegetation composition and structure to conserve the forage resources.	2004-2009	SB, IF	AS, FE, MA
4.	Undertaking measures on restoring nesting areas and migration routes of animals.	2004-2007	SB, IF, EF	MNP, AS, FE
5.	Developing and introducing recommendations on stopping the processes of soil erosion and degradation in mountain-desert ecosystems.	2004-2009	SB, LM	SCL, MNP
C. RESEARCH AND MONITORING				
1.	Inventorizing pastures.	2004-2006	SB	AS, SCL
2.	Inventorizing vegetation communities.	2004-2009	SB, IF	AS
3.	Inventorizing the main habitats of vertebrate animals.	2004-2009	SB, IF	AS, FE
4.	Organizing researches of the main biodiversity components in mountain-desert ecosystems.	2004	SB, IF	AS, MNP
5.	Developing recommendations on speeded-up restoration of the degraded vegetation community structure and functions.	2004-2005	SB	AS, FE
6.	Restoring the Chechekty biostation in the Murgab district of the GBAR.	2004-2008	SB	AS, LKh
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Shooting a videofilm and organizing TV and radio programs on high mountain biodiversity conservation and global value.	2004-2006 and on	SB, IF	MNP, AS, LKh
2.	Organizing and holding seminars, conferences, and round tables on improving the pasture vegetation.	2004-2006	SB, IF	AS, SCL, MNP, FE
3.	Showing films on the issues of poaching and its negative effects.	2004-2005	SB, IF	MNP, FE, AS
4.	Organizing public discussions of the issues of poaching and its negative effects.	2004-2005	SB, EF	MNP, FE, AS
5.	Preparing and publishing booklets on rare and endangered species of animals and plants from mountain-desert ecosystems.	2004-2005	SB, IF	AS, MA, MNP, FE

3.9. Action Plan on Conservation of High Mountain Meadow and Steppe Ecosystems

The measures are aimed at regulating the farming and nature use in meadow and steppe ecosystems.

Particular attention is paid to regulating pastures, which cover almost 90% of the entire ecosystem area. The most important issues of conserving the biodiversity of meadow and steppe ecosystems are: improving the legislative base of pasture management, regulating pasturing in areas of species listed in the Red Data Book, inventorying and passportization valuable communities, and developing technologies of meadow sustainable management.

The most important part of monitoring is to study the productivity dynamics of valuable forage

and medicinal species, to determine the percentage of strange and invasive species in the composition of steppe and meadow communities.

The implementation is long-term, sometimes permanent. Priorities and regional measures on conservation a number of genetic pools of plants and animals species included in IUCN, having global value.

The measures on the Plan realization include scientific, controlling, industrial, and financial bodies of the country.

To implement primary work, the amount of US\$1,885,000 is supposed. Implementing these actions in the nearest 7-10 years will promote conserving the specific composition of valuable forage plants, alleviating the threat of extinction of rare animals and endemic forage and medicinal plants of global value.

Table 3.9. Action Plan on Conservation of High Mountain Meadow and Steppe Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Improving the system of interrelations between land-users, enhancing their responsibility for the value communities conservation.	2004-2009	SB, EF	AS, MNP, FE, NGO
2.	Developing and approving regulations on using mountain steppe ecosystems.	2004-2006	SB, LM	MA, FE, MNP, AS
3.	Improving the regulations on melioration of degraded areas of meadow-steppe communities.	2005	SB, EF	AS, MNP
4.	Improving the control of hunting.	From 2004 on	SB, EF	MNP, AS, FE
5.	*Reinforcing the environmental regime in areas of rare and endangered plant and animal species.	From 2004 on	SB	FE, MNP
6.	Reducing the limits on gathering medicinal and food plants; licensing.	From 2004 on	SB	FE
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	*Regulating the use of pastures in areas of valuable steppe communities.	2004-2005	SB	AS, MNP
2.	Improving methods of pasturing within the range of species listed in the Red Data Book.	2004-2009	SB, IF	AS, MA, FE
3.	Developing and introducing update technologies in pasturing.	2004-2007	SB	SCL, MA, LKh, TAAS, farms
4.	Undertaking measures on reducing the ploughed lands on steep slopes and within the areas of valuable flora and fauna species.	2004-2005	SB, LM	MA, SCL, AS, MNP, TAAS, LKh
C. RESEARCH AND MONITORING				
1.	Inventorying and passportization of valuable communities and habitats of plant and animal species.	2004-2009	SB, IF	AS, MNP
2.	Biomorphological investigation of the main dominants of the vegetation cover and fauna on the Hissar Range.	2004-2006	SB, IF	AS, MNP
3.	Establishing trends of biodiversity transformation in mountain-steppe areas.	2004-2009	SB, IF	AS, MNP
4.	Developing complex measures on restoring disturbed populations of wild animals and plants.	2004	SB	AS, MNP

Table 3.9. continued

1	2	3	4	5
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Preparing and distribution of information on new technologies introduction in cultivating highly productive forage plants.	2004-2010	SB, LM	AS, MNP, TAAS, MM, NGO
2.	Organizing and holding seminars and conferences for people interested in conservation, restoration, and sustainable management of biological resources.	2004-2007	SB, LM	AS, MNP, MA
3.	Developing and issuing informational maps and reference materials on valuable communities of mountain steppes.	2004-2006	SB, LM	AS, MNP, MA

3.10. Action Plan on Conservation of Mid Mountain Conifer Forest Ecosystems

The actions are aimed at conservation of valuable juniper forests, occupying soil-ground lands, unsuitable for other forest breeds.

Conservation of juniper forests and their biodiversity requires changing the legislation and institutional base to promote organizing specialized reserved zones in juniper forests and allotting particular fragments of juniper forests to private persons.

To provide the bioproductivity and prevent natural disasters, actions on enlarging forest areas (10%) for a 10-15 year period is planned. A further increasing in volume of forest conservation work through enlarging the forest nursery areas is needed. The Action Plan includes a number of measures on regeneration of juniper forests and balanced development of their biodiversity. First of all, the biodiversity specific composition of these ecosystems is to be conserved by developing specific programs and projects, aimed at improving the composition and structure of globally important communities and fauna migration routes and habitats.



Mountain light forests

To carry out forest organizing work is important; drawing up a juniper forest typological map and restoring the forest monitoring base is most urgent. Zones requiring special treatment are to be distinguished within the areas of juniper forests. The development of the National Strategy and Action Plan on sustainable development of juniper forests should be one of the national priorities.

The development of education and popularization of juniper forest conservation and restoration is also a priority. The Plan implementation will require US\$1,038,000.

Table 3.10. Action Plan on Conservation of Mid Mountain Conifer Forest Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Improving the policy of the country forest sector activity.	2004-2005	SB	Government, FPE
2.	Including requirements of biodiversity conservation and resource sustainable management in the forest sector policy and program.	2004-2005	SB, EF	Government, FPE, MNP
3.	*Developing new and improving current regulations on the forest resource conservation and sustainable management.	2004-2006	SB	FPE, MNP
4.	Developing and approving regulations on reforestation and aforestation.	2004-2005	SB	Government, FPE

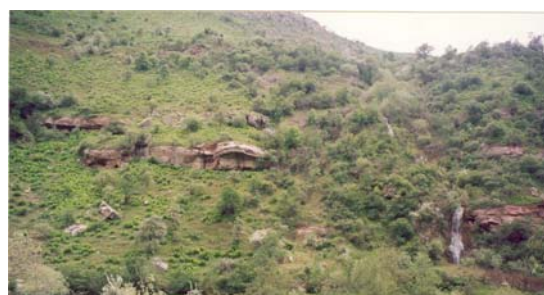
Table 3.10. continued

1	2	3	4	5
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Introducing update planning systems in forest biodiversity conservation.	2004-2006	SB	FPE, MNP, AS
2.	Developing a scientifically characterized state program on forest restoration and protective belt creation.	2004-2005	SB	AS, FPE
3.	*Organizing permanently operating forest nurseries for raising young juniper plants on the area of 100 hectares (Sogd Region, Shakhristan District).	2004-2005	SB, EF, LM	FPE, LKh
4.	Developing and introducing methods of forest management, promoting conservation of endemic, relic, and endangered species.	2004-2009	SB, LM	FPE, AS
5.	Developing measures on preventing juniper forest fragmentation.	2004	SB	FPE
C. RESEARCH AND MONITORING				
1.	Developing and introducing biotechnological methods in reproducing juniper species and restoring forest ecosystems.	2004-2009	SB, LM	AS, MEP, FPE
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Preparing and issuing a monograph on forest genetic resources.	2004-2005	SB, IF, EF	FPE, AS, MNP
2.	Preparing and issuing a reference book on the status of forest ecosystems of Tajikistan.	2004-2006	SB, EF	FPE, AS
3.	Preparing and issuing popular book on the role of mountain forests in the economic balance.	2004-2006	SB	FPE, AS, MNP
4.	Preparing and issuing photo album "Forest Biodiversity of Tajikistan".	2004-2006	SB, EF	FPE, AS, MNP
5.	Preparing and issuing a guidebook of the major tourist routes over forest ecosystems.	2004-2008	SB, EF	MNP, MET
6.	Providing incentives for the population in conservation and restoration of valuable forest communities and habitats of valuable animal species.	From 2004 on	SB, EF	MNP, FPE
7.	Preparing and issuing booklets on rare and endangered plants and animals species..	2004-2006	SB, EF	FPE, AS

3.11. Action Plan on Conservation of Mid-Mountain Mesophyllic Forest Ecosystems

Measures are aimed at restoring and enlarging the valuable mountain mesophyllic forests and conservation of their biodiversity having global and socio-economic significance. Biodiversity conservation requires improving the legislation and institutional base to provide restructuring and excluding forested areas from the list of pasturing and other economically used lands and allotting them to private persons.

To provide water-, soil-protection, and other environmental functions, the forest plantations of walnut, maple, and birch should be enlarged up to 50% of the total volume of mesophyllic forests in 10 years. This volume promotes increasing the area of walnut, maple, and birch forests on steep-sloped and weed-floodplain territories of Central, Eastern Tajikistan and in the



Xerophytic light forest

Pamirs, where forest areas are reduced by 5 to 8 thousand hectares annually. The Action Plan includes conservation of the genetic resources of wild fruit varieties of global value.

Inventorying and drawing up maps of particular vegetation formations of mesophyllic forests, estimating biodiversity population numbers, and evaluating the state of mesophyllic forest biodiversity monitoring are very important.

The Action Plan includes holding international and national seminars for checking the investments, and training forest specialists at the national level.

The Plan implementation is short-, medium-term, and permanent.

Because of the strained socio-economic situation in the country, a considerable amount of the funds is provided by international and private foundations, as well as foundations of forestry and environmental organizations. The total approximate amount of funds required for the Plan implementation is US\$1,223,000.

Table 3.11. Action Plan on Conservation of Mid-Mountain Mesophyllic Forest Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Including the issue of conserving and extending areas of walnut forests in the Strategy measures on poverty alleviation.	2004-2005	SB, EF	Government, MNP, FPE
2.	Improving laws on broad-leaf forests biodiversity conservation.	2004-2006	SB	Government, FPE
3.	Organizing microzakazniks in the area of birch forests, wild apple and pear communities.	2004-2006	SB	Government, FPE, LKh
4.	Establishing a special regime of economic activity in the area of small-leaf and broad-leaf forests.	2004-2006	SB, EF	Government, FPE, LKh
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	*Developing specialized program on restoring the walnut forest area.	2004-2005	SB, LM, EF	SCL, FPE, MNP
2.	Completely prohibiting pasturing, forest cuttings, and building houses in the area of walnut, birch, and apple forests.	2004-2006	SB	SCL, FPE MNP, LKh
3.	Expanding the zone of potential raising of walnut forests.	2004-2006	SB, LM	SCL, FPE
4.	Organizing forest nurseries for raising young plants.	From 2004 on	SB, EF	FPE, MNP, NGO
5.	Excluding all forested areas from those used for economic activity.	2004-2008	SB, LM	FPE, SCL, MA
6.	Improving walnut forests and apple groves, as valuable forest formations.	2004-2006 and on	SB, LM	FPE, MNP
7.	Raising the potential of forest enterprises in growing walnuts.	2004-2005	SB, EF	FPE, MNP
8.	Improving biotechnical work on walnut forest restoration.	2004-2006	SB, IF, EF	FPE, MNP
C. RESEARCH AND MONITORING				
1.	Carrying out intensive research on forest taxation and development.	2004-2007	SB, IF, EF	FPE, MNP, LKh
2.	*Inventorying mesophyllic forest biodiversity.	2004-2007	SB	AS, FPE, MNP
3.	Drawing up map of existing forests and potential areas of raising walnut forests.	2004-2007	SB, LM	FPE, SCL
4.	Selecting and raising walnut, pear, and apple varieties in a nursery.	From 2004 on	SB	FPE, TAAS, AS
5.	Drawing up map of mesophyllic forest dynamics.	2004-2006	SB, LM	FPE, AS
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Organizing and holding international and regional conferences on conservation of unique walnut forests and exchange of experience.	From 2004 on	SB, LM	FPE, MNP
2.	Preparing advertising and informational publications and educational materials on conserving the genetic resources of broad-leaf forests.	From 2004 on	SB, LM	NGO, NBBC
3.	Producing common consumer goods and works of folk arts, based on the products of broad-leaf forests.	From 2004 on, periodically	SB	FPE, UNESCO, etc.
4.	Organizing exhibitions and auctions to advertise and sell goods, produced of walnut varieties, and other forest products.	From 2004 on, periodically	SB	FPE, LKh

3.12. Action Plan on Conservation of Mid-Mountain Xerophytic Light Forest Ecosystems

The actions are aimed at decreasing the anthropogenic impact and enlarging the natural increase of xerophytic light forests in southern and northern Tajikistan, where considerable fragmentation of valuable communities is observed.

Improving the laws of restricting the active use of valuable communities of xerophytic light forests will promote natural enlargement of pistachio and jujube forest areas; it will also provide practicing in allotting these communities to private persons and families.

Restructuring pistachio forests according to value categories and establishing special protected regime are required to restore xerophytic light forests of Northern and part of Southern Tajikistan approximately by 20% in 7-8 years.

Organizing protected regime in particular plantations of persimmon, pomegranate, and fig will help to conserve the genetic resources of wild relatives of globally important fruits, and to preserve rare and endangered species – Tajik wild ram, Severtsev's wild ram, venomous snakes (cobra).

Inventorizing and drawing up maps of xerophytic light forests and studying biomorphology of their main components will allow introduction of new technologies of improving the state of xerophytic forests and enriching the composition of the vegetation and animal diversity.

Many actions are permanent; funds for their implementations are to be received from the state budget and the benefits of forest products management.

The approximate cost of the Action Plan implementation is estimated at US\$1,415,000.

Table 3.12. Action Plan on Conservation of Mid-Mountain Xerophytic Light Forest Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Improving laws and regulations on the restriction of cattle grazing and cutting out young pistachio plants.	2004-2006	SB	Government, FPE
2.	Widening functions and powers of state institutions of forest protection.	2004-2005	SB	Government, FPE
3.	Allotting pistachio light forests to persons and organizations on the long-term base.	From 2004 on	SB	SCL, FPE LKh
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Classifying and subdividing (according to value) pistachio forests into categories of reinforced, medium, and sustainable regime of conservation.	2004-2007	SB, LM	Government, FPE, SCL, LKh
2.	Establishing zone of strict protection of pistachio forests and creating zakazniks and mirozapovedniks.	2004-2006	SB	Government, FPE, SCL, MNP
3.	Restoring pistachio forests on steep slope and gully territories.	From 2004 on	SB, LM	FPE, MNP, LKh, NGO
4.	*Organizing microzakazniks to conserve valuable communities of pomegranate, fig, jujube, and persimmon forests.	2004-2008	SB, LM	AS, FPE
C. RESEARCH AND MONITORING				
1.	*Inventorizing xerophytic light forests.	2004-2008	SB, LM	FPE, SCL, AS
2.	Drawing up map of xerophytic light forests, 1:1000 000.	2004-2006	SB, IF	AS, FPE
3.	Determining floristic and fauna composition of xerophytic light forests.	2004-2008	SB, IF	AS, FPE
4.	Determining dynamics of development of pistachio, jujube, persimmon, pomegranate forests and their communities.	From 2004 on	SB, LM	AS, FPE
5.	Studying the ecological and biomorphological features of xerophytic light forest edifications.	From 2004 on	SB, LM	AS, FPE

Table 3.12. continued

1	2	3	4	5
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Organizing seminars, trainings, round tables; popularizing the need of xerophytic forest conservation in mass media.	From 2004 on	SB, LM	FE, MNP, AS
2.	Shooting a popular film "Light Forests".	2004-2006	SB, LM	NGO, FE
3.	Organizing production of museum and training exhibitions.	From 2004 on	SB, LM	FE, public work

3.13. Action Plan on Conservation of Semisavanna Savannoide Ecosystems

Measures are aimed at preventing further degradation of valuable grass communities and their zoocenosis on the low-mountain areas of the country, and improving the productivity of winter pastures. The Action Plan provides conservation of numerous wild relatives of food, forage, and other valuable and useful floras and faunas of regional and national importance. Improving the laws of nature use and land management will promote improvement of pasture productivity, in-

crease in numbers of valuable and useful animal and plant species, providing environmental balance within biocoenoses and between their components. Reconstructing and reforming the farming structure will allow to transfer grasslands with rare and endemic species to the private possession (on lease terms). Actions in the sphere of education will help to teach nature-users to make thrifty use of natural biodiversity.

Considerable investments will be made by the country. The total supposed expenses are US\$1,069,000. International investments are supposed for the most comprehensive work and research.

Table 3.13. Action Plan on Conservation of Semisavanna (Savannoide) Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Improving laws on preventing ploughing up and cultivation of rare and endemic plant and animal habitats.	2004-2006	SB, LM	AS, MNP, SCL, LKh
2.	Developing annual regulations on haymaking within the areas of species listed in the Red Data Book of Tajikistan.	2004-2006	SB	MNP, AS, SCL, LKh
3.	Developing rules and reinforcing the procedure of using biodiversity at the local level.	From 2004 on	SB	AS, LKh, MNP
4.	Developing special law of regulating activities in the areas of migratory animals within savannoide ecosystems.	2004-2006	SB	Government, MNP, AS
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Excluding steep-sloped lands with rare and endemic floras and faunas out of the ploughed area plan.	2004-2006	SB	SCL, LKh
2.	*Extending the area of wild medicinal plants.	From 2004 on	SB, EF	SCL, MNP, LKh
3.	Placing responsibility for conservation of valuable animal and plant habitats within primary and secondary land use.	From 2004 on	SB	LKh
4.	Allotting lands of boundary belts between ploughed fields for bird nesting and conserving wild relatives of grass plants.	From 2004 on	SB	LKh
C. RESEARCH AND MONITORING				
1.	Controlling the dynamics of transforming vegetation cover of the major grass communities in high-grass savanna.	From 2004 on	SB, LM	MNP, LKh, SCL, AS
2.	Estimating the numbers of species and phytomass volume of medicinal, forage, and other plants per area unit.	From 2004 on	SB, LM	MNP, LKh, SCL, AS
3.	Determining ratios of uneatable and noxious strange plants in the composition of grasslands winter pastures.	From 2004 on	SB, LM	AS, LKh, SCL, MA
4.	*Creating a bank of wild flora seed material.	From 2004 on	SB, LM	MA, AS, LKh, SCL

Table 3.13. continued

1	2	3	4	5
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Organizing and holding seminars and meetings on sustainable management of food, forage, and medicinal plants.	From 2004 on	SB, LM, EF	FD, MNP, AS, LKh
2.	Training specialists in botany and geography.	From 2004 on	SB	ME
3.	Issuing popular scientific books, booklets, and manuals on gathering and drying plants, keeping seeds, haymaking, and elements of pasturing.	From 2004 on	SB, LM, EF	MNP, AS, FE, NBBC

3.14. Action Plan on Conservation of Foothill Semidesert and Desert Ecosystems

Actions are aimed at conserving sand-desert semi-woody, shrub, and subshrub communities, occupying southern and northern Tajikistan and Western Pamir river valleys of national and regional value. Improving the laws and regulations on organizing active farming in semidesert and desert ecosystems will provide stopping formation of sand-hills, conserving the animal world, reserved and adjacent to reserved zones of global value, particularly conserving winter migratory species: gazelle, northern monitor lizard, sand boa, cobra, etc.

Organizing trainings and seminars at the local settlements will provide more information of bioresources conservation and sustainable man-

agement and conservation of rare and endemic plant and animal species.

Considerable part of funds is to be provided by the state and local ecological foundations. To realize the actions on preserving the genetic resources of global value, the Plan envisages using funds of international foundations. The total amount of funds is supposed to be US\$821,000.



Foothill Semidesert and Desert Ecosystem

Table 3.14. Action Plan on Conservation of Foothill Semidesert and Desert Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Developing laws and regulations preventing extension of ploughed lands at the expense of near-reserve areas.	2004-2006	SB	SCL, MNP, LKh
2.	Establishing semi-reserve regime of nature use on sand-desert areas.	2004-2007	SB	SCL, LKh
3.	*Creating microzapovedniks and microzakazniks within the areas of rare and endemic animals and plants.	2005-2007	SB, IF	Government, MNP, FPE, LKh
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Determining semidesert and desert areas suitable for restoring valuable communities and habitats of animals.	2004-2006	SB	SCL, MNP, LKh, MA
2.	Allotting areas for restoring saxaul.	2004-2006	SB	SCL, LKh, MA
3.	Preparing seed-fund and taking biotechnical measures on creating artificial communities.	From 2004 on	SB	MA, SCL, LKh
4.	*Restoring saxaul in the buffer zone of the Tigrovaya Balka Reserve.	2004-2009	SB, IF, LM, EF	MNP, FPE, AS, MA
C. RESEARCH AND MONITORING				
1.	Inventorizing sand-desert communities.	2004-2007	SB, LM	SCL, MA, AS
2.	Organizing monitoring of standard areas in near-reserve zones.	From 2004 on	SB	TAAS, AS, LKh
3.	Estimating numbers of particularly valuable flora and fauna species in standard areas and determining trends of their transformation.	2004-2011	SB, LM	AS, LKh, SCL

Table 3.14. continued

1	2	3	4	5
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Shooting a videofilm about the Tigrovaya Balka Reserve.	2004	SB, IF, LM	AS, MNP, LKh
2.	Restoring the Museum and Chronicle of zapovednik nature.	2004-2006	SB, IF, EF	AS, MNP, FE
3.	Organizing seminars for the local population on the value of zapovedniks and the need of their conservation for the present and future generations.	2004-2005	SB, LM, IF	AS, MNP
4.	Including PNA (zapovedniks, zakazniks, National park, and natural monuments), as sections and topics, in school and university programs on natural history and ecology.	2004-2006	SB, LM	AS, MNP, LKh

3.15. Action Plan on Conservation of Wetland Ecosystems

Actions will provide improvement of the legislative and institutional base for conserving wetland ecosystems, located on plains and high mountain areas of the country. The main sections are aimed at raising the potential of existing nature reserves providing conservation of rare tugai and floodplain forests of global value and wetlands with numerous animal species assigned exclusively to these ecosystems.

The most important measure is the area planning of lake water surface and developing programs on restoring valuable biocoenosis of reservoirs in Central and Northern Tajikistan, the high-mountain lakes of the Pamirs with rare species (bar-headed goose) of global value, and conserving the Tigrovaya Balka Reserve in southern Tajikistan.

Monitoring and studying the biodiversity of lakes and its dynamics will promote making valid assessments for improving their state and sustainable management. Restoring the laboratory analytical work on hydrobiological monitoring will provide a base for research of and recommendations on biodiversity conservation.

Organizing ecotourism over Tajik lakes will promote improving skills of specialists in environmental protection and sustainable management. Developing recommendations on preventing lakes pollution with industrial waters will provide sustainable development of water ecosystems. Considerable part of the Plan requires urgent measures; most of the actions are designed for the long-term period, with considerable amount of funds both from the state budget and international foundations. The total amount of funds is US\$1,505,000.

Table 3.15. Action Plan on conservation of wetland ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Improving cooperation between the national working body of the Convention on Biological Diversity with other Conventions . Developing mechanism of reporting and providing information of wetland biodiversity.	2004-2006	SB, LM	Government, GWG
2.	Enhancing the responsibility of the working group of the Convention on Wetlands and the Convention on Migratory Species and submitting report to the working group of the Convention on Biodiversity.	2004-2005	SB, LM	Government, GWG
3.	Improving the legislation on water-protected zones and belts.	2004-2005	SB	MMWM, MNP, LKh
4.	Raising the potential of PNA included in water and coastal ecosystems.	2004-2006	SB, IF, EF	FPE, MNP
5.	Developing regulations and standards on realizing the Law on water-protected zones and belts of rivers and lakes.	2004-2006	SB	MMWM, MNP, FPE
6.	Improving the legislation on conservation and restoration of ichthyocoenosis and hydrobiont habitats.	2004-2006	SB	MMWM, MNP, FPE

Table 3.15. continued

1	2	3	4	5
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	*Developing and implementing program on restoring water areas.	2004-2009	SB, LM	MMWM, FPE, MNP, AS, MO
2.	*Developing program on reducing the chemical contamination of watercourses.	2004-2006	SB, IF, EF	MA, SCL, MNP, LKh
3.	Developing and implementing program on restoring tugai ecosystems.	2004-2006	SB, EF	MNP, FPE, SCL, LKh
4.	Developing and introducing programs on restoring tugai forests in the Syrdarya River basin.	2004-2006	SB, EF	FD, MNP, LKh
5.	Protecting the most valuable areas of tugai flood-plain forests and developing recommendations on their conservation.	2004-2009	SB, EF	FD, MNP, LKh
6.	Undertaking urgent measures on fostering the protection regime of the Tigrovaya Balka Reserve.	2004-2007	SB, EF, IF	FD, MNP, LKh
7.	Regulating the agricultural activity in areas of tugai flood-plain forests.	2004-2007	SB, IF	SCL, FE, MA, LKh
8.	*Developing and introducing recommendations on stopping erosion in the water-collecting basin of the Nurek Reservoir.	2004-2006	SB	FD, MNP, SCL, MMWM
9.	Developing programs on conservation and restoration of the bar-headed goose populations.	2004-2005	SB, IF	MNP, AS, LKh
C. RESEARCH AND MONITORING				
1.	*Organizing system of monitoring the water and near-water ecosystems.	2004-2009	SB, IF	MEP, GWG
2.	Inventoring the main biodiversity components of water and near-water ecosystems.	2004-2009	SB, IF	MEP, GWG, NGO
3.	Studying the representative water and near-water ecosystems and evaluating the biota status according to the requirements of the Convention on Wetlands.	2004-2006	SB, IF	MNP, GWG
4.	Developing recommendations on conservation of valuable habitats of water and near-water fauna and flora.	2004-2006	SB	AS, MNP
5.	Carrying out monitoring of valuable flood-plain tugai forests.	2004-2006	SB	FPE
6.	Restoring scientific research activity of laboratories of reserved areas.	2004-2006	SB	FPE, AS
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Preparing demonstration educational aids on unique near-water plants and animals.	2004-2005	SB	AS, LKh
2.	Organizing excursion routes over unique near-water habitats of valuable animal communities.	2004-2006	SB, LM	AS, MNP, MO
3.	Providing information on the status of water and near-water ecosystems (TV and radio programs, films, publications) for the public.	Regularly	SB	MNP, MC, KTP
4.	Organizing discussions and round tables on conservation of the Tigrovaya Balka Reserve biodiversity.	From 2004 on	SB, EF	MNP, AS

3.16. Action Plan on Conservation of Agroecosystem Biodiversity

The actions promote the development of laws preventing active use of land resources in areas of rare endemic plant and animal species and valuable communities. While carrying out area planning, conservation of genetic resources of global and regional value is provided. One of the main actions is preventing large-scale distri-

bution of strange and invasive species. Realizing agrobiodiversity monitoring in mountain landscapes will provide harmonic combination of the economic activity and biodiversity conservation and its sustainable management. At the same time, controlling the state of overland and soil biodiversity is provided, cartographic materials on microagrobiological zonation of the areas occupied by agroecosystems are created.

Complete implementation of these actions is provided by: systematic holding of seminars and courses on skills improving, organizing educational work on conserving the genetic resources, issuing teaching aids on agrobiodiversity conservation and sustainable management. All organizations of the agroindustrial complex, NGOs, etc., will take part in the Plan implementation. The approximate budget is US\$2,657 000.



Mountain pasture

Table 3.16. Action Plan on Conservation of Agroecosystem Biodiversity

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Developing laws on conserving rare and endemic species of biodiversity and their habitats in the non-irrigable zone.	2004-2006	SB	Government, MNP, MA
2.	Improving laws on controlling and preventing the distribution of quarantine alien and invasive species.	2004-2011	SB	Government, MNP, MA
3.	Enhancing responsibility of nature-users for providing conservation of rare and unique species habitats and communities within the water areas, managed by them.	2004-2005	SB	Government, MNP, MA
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Creating a collection of rare and dangerous varieties of fruits and vegetables, berries and melons.	2004-2006	SB	AS, TAAS, MA
2.	*Creating a database of genetic resources of fruits and vegetables, berries and melons.	2004-2006	SB	AS, TAAS
3.	Conserving biodiversity in cattle breeding farms.	2004-2009	SB, IF	TAAS, LKh
4.	*Creating a germ plasma bank of collection breeds of animals.	2004-2010	SB, IF	TAAS, MNP, MA
5.	Organizing nursery for yak breeding.	2004-2008	SB, IF	MA
6.	Developing programs on yak acclimatization and their area expansion in high-mountain landscapes of Tajikistan.	2004-2006	SB, IF	TAAS, LKh
7.	*Developing recommendations on creation of shelter belts and migration passages of wild animals.	2004-2009	SB, IF	AS, MNP, MA, LKh
8.	Conserving biodiversity of local varieties and wild relatives of cultivated plants and animals.	2004-2009	SB, IF	AS, TAAS, LKh
9.	Developing complex action plan on agrobiodiversity conservation of local varieties of fruits and vegetables, berries and melons.	2004	SB	AS, TAAS, MA
10.	Organizing local reservations on conservation and sustainable management of wild relatives of cultivated plants and animals.	2004-2007	SB, LM	AS, TAAS, LKh
11.	*Creating zakazniks for restoring populations of wild relatives of cultivated plants and preventing the threat of their degradation.	2004-2006	SB	AS, FPE
C. RESEARCH AND MONITORING				
1.	Developing system of agrobiodiversity evaluation and monitoring.	2004-2005	SB, LM	MA, LKh
2.	Analyzing the status of agricultural ecosystems and developing recommendations on improving their environment-stabilizing properties.	2004-2006	SB	MA, MNP
3.	Organizing monitoring system of combination of agrobio-coenosis with other ecosystems.	2004-2009	SB, LM	AS, TAAS, LKh
4.	Collecting data and creating a database of wild relatives of cultivated plants.	2004-2006	SB, LM	AS, TAAS, LKh

Table 3.16. continued

1	2	3	4	5
5.	Inventoring local varieties and wild relatives of cultivate plants.	2004-2006	SB, IF, LM	AS, TAAS, MNP, LKh
6.	Drawing up range charts on local varieties and wild relatives of cultivated plants.	2004-2007	SB, IF	AS, TAAS
7.	Studying intraspecific (population) variability and distinguishing genetic resources.	2004-2009	SB, IF	AS, TAAS
8.	Studying insects – pollinators of agricultural plants.	2004	SB	AS, TAAS
9.	Studying the status of soil biodiversity.	2004-2006	SB, IF	TAAS, LKh
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Popularizing conservation of genetic resources of plants and animals (advertising issues, booklets, films, exhibitions).	2004-2007	SB, LM	TAAS, AS, LKh
2.	Publishing the book “Wild and Cultivated Varieties of Fruits and Vegetables of Tajikistan”.	2004-2006	SB, LM	TAAS, LKh
3.	Preparing and issuing the manual “Agrobiodiversity Conservation”.	2004-2006	SB, LM	TAAS, AS, LKh
4.	Holding seminars on training farmers in update methods of economic activity, including agrobiodiversity conservation.	2004-2010	SB, LM	TAAS, AS, LKh

3.17. Action Plan on Biodiversity Conservation in Urban Ecosystems

The actions include: organizing measures on conservation and sustainable management of green plantations and forest and savannoid ecosystem fragments; providing monitoring of urban green zones and animals.

Inventoring and analyzing urban biocenosis will promote the development of recommendations on: improving green plantations; selecting tree, shrub, and lawn varieties to keep the urban ecological balance. Organizing monitoring will help to determine the general trends of work on

planting trees and gardens, with the state of urban environment being considered.

The educational work is aimed at increasing the general level of the public environmental awareness of taking care of green planting; and forming the aesthetic attitude of the population to urban biodiversity.

The terms of the plan implementation is subdivided into periods of development of plan and program documents and their stage-by-stage realization. To implement the actions, funds from the state budget and other local, international, and private foundations are to be used; the amount is estimated at US\$765,000.

Table 3.17. Action Plan on Biodiversity Conservation in Urban Ecosystems

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	*Developing draft laws and standards of green plantations in urban ecosystems.	2004-2005	SB, EF	MA, FPE, LKh
2.	*Reinforcing environmental requirements of biodiversity conservation in town-planning.	2004-2005	SB	MNP, LKh
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Developing plans on managing the most important urban green zones.	2004-2005	SB	MNP, LKh
2.	Restoring and enlarging shelter green belts of industrial zones.	2004-2006	SB	FPE, MNP, LKh
3.	Creating and enlarging green belts of cities.	2004-2009	SB	FPE, MNP, LKh
C. RESEARCH AND MONITORING				
1.	*Estimating the valuable urban and rural green zones.	2004-2009	SB	MA, SCL, MNP, FPE
2.	Organizing monitoring system of green zones at the national and local levels.	2004-2006	SB	MNP, FPE

Table 3.17. continued

1	2	3	4	5
3.	Developing and implementing program on studying the state of urban ecosystems.	2004-2006	SB	MNP, AS
4.	Inventorizing and analyzing the specific composition of urban ecosystems, including alien and invasive species.	2004-2006	SB	AS, LKh
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Organizing system of educating and improving skills of specialists in green zone organization and maintenance.	2004-2009	SB	MNP, NGO
2.	Publishing advertising and informational materials on green zones and their importance in maintaining the environmental balance.	2004-2006	SB, LM	MNP, FPE, LKh
3.	Involving the population in work on enlarging green zones and aforestation of foothill areas with local flora.	2004-2006	SB	MNP, FPE, AS

3.18. Action Plan on Species Conservation in Natural Habitats (*in-situ*)

Species and intraspecific units are the main genetic material, on which the material welfare is based.

The abundance of biodiversity is estimated by the presence of unique species and intraspecific taxa. The most sustainable method of species conservation is its conservation in natural habitats. With this factor being taken into consideration, the Action Plan includes improving the genetic resource conservation and preventing harmful impact to rare and endemic species habitats. The main trend in conserving species and intraspecific categories is creating space for species migration and preventing fragmentation of population areas. One of the key statements of the Plan is organizing small reservations for conserving particular endangered species.

To provide valid scientific approach to conservation of species and intraspecific taxa, the Action Plan includes inventorying and studying the specific composition and structure in zapovedniks and zakazniks, as well as within species habitats. Special attention is paid to studying the genetic resources of economic, adornment, and environmental value.

The Action Plan also includes measures on creating advertising and teaching aids, promoting the environmental education of people, teaching them to take care of unique species and the specific diversity of the vegetation and animal worlds, as a whole.

State, scientific, and economic bodies, directly related to biodiversity conservation, take part in the Plan implementation. The Plan includes short-term and long-term measures. The total amount of funds is US\$1,452,000.

 Table 3.18. Action Plan on Species Conservation in Natural Habitats (*in-situ*)

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	*Developing and approving the law on genetic resources conservation.	2004-2005	SB, EF	AS, MNP, MA
2.	*Developing and approving the law on vegetation.	2004-2006	SB, EF	AS, MNP
3.	Improving the legislation on compensation of damages caused to rare plant and animal species and their habitats.	2004	SB, EF	MNP, FE
4.	Developing and improving laws and regulations on removal of biological resources from natural habitats.	2004	SB, EF	MHP, AS, FE
5.	Developing and approving the law on hunting and sustainable management of game animals.	2004-2005	SB, EF	AS, MHP, TAAS
6.	Developing and approving the law on valuable plant communities and species habitats.	2004-2005	SB, EF	AS, MNP
7.	Developing law on economic activities in the range zones of rare and endemic species.	2004-2006	SB, EF	AS, MNP, FE

Table 3.18. continued

1	2	3	4	5
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	Developing complex program on preventing a further drop in numbers of species and populations.	2004	SB, EF	AS, MNP
2.	Undertaking measures on preventing habitat fragmentation and restoring the corridors of animal migration and plant distribution.	2004-2007	SB, EF	MNP, FPE, AS
3.	Developing and implementing programs on species conservation and preventing spreading of alien and invasive species.	2004-2006	SB, EF	AS
4.	Organizing nursery for growing plants listed in the Red Data Book of Tajikistan.	2004-2006	SB, LM, EF	AS, MNP
5.	Organizing prospecting semi-permanent research on estimating the number of the Menzbier's marmot.	2004-2005	SB, WR, EFKR	AS, LKh, MNP
6.	Developing recommendations on restoration of the Menzbier's marmot number until the threat of extinction is prevented.	2004-2005	SB, WR, EF	AS, LKh, MNP
7.	Establishing protected regime in densely populated areas of the Urial.	2004-2009	SB, WR, EF	AS, FPE, MNP, LKh
8.	Estimating the number of the Urial in a zone of xerophytic forest ecosystems.	2004-2009	SB, WR, EF, Interhunting Foundation	AS, FPE, MNP, LKh
9.	Inventorying waterfowls of Tajikistan.	2004-2011	SB, WR	AS, FPE, MNP, LKh
10.	Evaluating the status of rare and endemic waterfowl habitats.	2004-2010	SB, WR	AS, FPE, MNP, LKh
11.	Drawing up maps of seasonal and annual habitats of waterfowls.	2004-2005	SB, WR, EF	AS, FPE, MNP, MA
12.	Developing the plan of actions on improving habitats of waterfowls.	2004-2006	SB, WR	GWG on Wetlands
13.	Organizing nursery for raising the Marco Polo wild ram (argali) in high-mountain-desert ecosystems.	2004-2011	SB, WR, Interhunting Foundation	MNP, FPE, AS, SBAR, LKh
14.	Carrying out scientific research and organizing monitoring of the Marco Polo wild ram (argali) migration.	2004-2011	WR, Interhunting Foundation	SBAR, LKh
15.	Organizing monitoring of seasonal and annual migration of bar-headed goose in its main habitats.	From 2004 on	WR, Interhunting Foundation	SBAR, LKh
16.	Establishing protected regime in habitats of bat species, listed in the Red Data Book.	2004-2008	SB, WR, EF	MNP, SCL, MA, AS
17.	Inventorying the habitats of venomous snakes and selectively estimating their numbers.	2004-2008	SB, GEF, EF	MNP, AS, PE, LKh
18.	Evaluating the status and reinforcing control of venomous snake serpentaria.	2004-2006	SB, GEF, EF	MNP, AS, PE, LKh
19.	Evaluating the habitats of falcon species listed in the Red Data Book and estimating their numbers.	2004-2008	SB, WR, EF	MNP, FE, AS
20.	Organizing falcon habitats conservation.	2004-2006	SB, WR, EFK	MNP, AS, LKh
21.	Creating serpentaria to raise tortoises for commercial purposes and medicine production.	2004-2009	SB, PO, EF	MNP, FE, LKh
22.	Organizing a monitoring of the main habitats of bustards and estimating their numbers.	2004-2006	SB, WR, EFK	MNP, AS, LKh, FE
23.	Establishing the reasons for wild animal synanthropization under various conditions of Tajikistan and developing measures on their regulation.	2004-2007	SB, WR, EFK	AS, LKh, MA
24.	Evaluating the status and determining the threat of strange species to natural ecosystems.	From 2004 on	SB, IF	MA, TAAS, AS, LKh
25.	Evaluating the habitats of relict and endemic fish species in the Amudarya and Syrdarya rivers.	2004-2011	SB, IF	AS, MNP

Table 3.18. continued

1	2	3	4	5
C. RESEARCH AND MONITORING				
1.	Determining the local genetic resources of cultivated plants and domestic animals; issuing the catalogue "The Genetic Resources of the Republic of Tajikistan".	2004-2005	SB	AS, TAAS, MNP
2.	Extending research of alien and invasive species of plants and animals and their ecological importance.	2004-2009	SB, LM, EF	AS, TAAS, MNP, LKh
3.	*Developing principles of identification of rare species and community categories (IUCN) and their selection for listing in the Red Data Book of Tajikistan (second edition).	2004	SB, LM	AS, TAAS, MNP
4.	*Inventorying rare and endangered species of PNA (Tigrovaya Balka, Romit, Dashti-Jum, and Zorkul zapovedniks).	2004-2009	SB, LM, EF	AS, TAAS, MNP, LKh
5.	Studying micromicets in natural ecosystems and developing recommendations on their conservation and sustainable management.	2004-2006	SB	AS, MNP
6.	*Organizing monitoring research of endangered species.	2004-2009	SB, LM, EF	AS, TAAS, MNP, LKh
7.	Inventorying and developing methods of restoration of medicinal, adornment, and food plant populations.	2004-2006	SB, LM, EF	AS, TAAS, MNP, LKh
8.	Developing and issuing recommendations on conservation and sustainable management of mountain onion, rhubarb, zira, ungermia, and other valuable food plants.	2004-2006	SB, LM, EF	AS, TAAS, MNP
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Issuing posters of protected plants and animals. Creating a relevant web-site and disseminating information through Internet.	2004	SB	AS, MNP
2.	Developing educational programs on conservation of dangerous species.	2004-2006	SB, LM, EF	AS, MNP
3.	Creating electronic database of rare and dangerous plants and animals.	2004	SB	AS, MNP

3.19. Action Plan on Biodiversity Conservation Outside Natural Habitats (*ex-situ*)

Despite the active efforts of the public, the anthropogenic impact on biodiversity is increasing. Due to the scientific and technological development, natural habitats of some species of vegetation communities are being reduced. This section of the Action Plan includes improving the legislation and the policy of joining the international agreements, which promote the national security and organization of national centers for genetic resources.

To conserve biodiversity and to introduce new economic and adornment useful species, great attention is focused on the educational and practical value of botanical gardens and collection materials. The monitoring research, mentioned in this section, will provide improving the biodiversity state in nurseries and botanical gardens, in con-



Botanical garden in Dushanbe

formity with the natural environmental conditions. Compiling teaching visual aids, based on the materials of botanical gardens, zoological museums, the zoo, collections, herbaria, and serpentaria, will promote increasing the educational level of the population on the country and world biodiversity. The implementation of the actions has long-term and short-term periods. The amount of funds is US\$690,000 for 10 years.

Table 3.19. Action Plan on Biodiversity Conservation Outside Natural Habitats (*ex-situ*)

No.	Measures	Terms of implementation	Financial source	Responsible for implementation
1	2	3	4	5
A. IMPROVING THE POLICY, LEGISLATION, AND INSTITUTIONAL BASE				
1.	Entering the Convention on International Trade in Endangered Species of Wild Fauna and Flora.	2004	SB	MNP
2.	*Developing draft law and regulations on genetically modified organisms (GMO).	2004-2005	SB, LM, EF	MNP, AS, LKh, TAAS
3.	Preparing agreements on joint using and sharing benefits of the collection of genetic and other resources with countries where the collection is deposited.	2004-2005	SB, EF	MNP, AS
4.	Developing draft law of biodiversity conservation <i>ex-situ</i> .	2004	SB, EF, LM	AS, MNP, TAAS, LKh
B. TERRITORIAL PLANNING, PROGRAMS ON BIODIVERSITY CONSERVATION				
1.	*Developing the national program on biodiversity conservation <i>ex-situ</i> .	2004-2006	SB, LM, EF	AS, TAAS, MNP
2.	*Creating a center of genetic resources.	2004-2006	SB, IF	AS, MNP
3.	Creating living collections of Rare Plants of Tajikistan Flora in Botanical gardens of the Academy of Science.	2004-2006	SB, EF	AS
4.	Creating Botanical Gardens (arboretum) based on the Vakhsh zonal experiment station.	2005	SB, LM	AS, TAAS
5.	Creating of experimental sample plot on the base of Var-sob mountain-botanic station "Kondara"	2003-2013	SB, EF, IF	NBBC, RLNP, AS
C. RESEARCH AND MONITORING				
1.	Developing state programs on studying biodiversity <i>ex-situ</i> .	2004	SB	AS, TAAS
2.	*Carrying out inventory and monitoring of biodiversity <i>ex-situ</i> .	2004-2006	SB, LM	AS, TAAS, MNP, LKh
3.	Creating a database of biodiversity <i>ex-situ</i> (flora, fauna, microorganisms).	2004-2006	SB, LM	AS, TAAS, MNP, LKh
4.	Developing the program "Strategy of Botanical Gardens on Plant Conservation".	2004-2005	SB	AS
5.	Compiling the list of the most priority plant species.	2004-2006	SB, LM, EF	AS, FPE, MNP, LKh
6.	Evaluating the status of game fish in watercourses of Tajikistan.	2004-2005	SB, IF	TAAS, LKh
D. TRAINING AND EDUCATION OF THE POPULATION				
1.	Issuing the popular scientific monograph "Biodiversity of Tajikistan <i>ex-situ</i> ".	2004-2006	SB, EF	AS, TAAS, MNP
2.	Developing educational programs for students of biodiversity conservation <i>ex-situ</i> .	2004-2006	SB, EF	ME, MNP, AS
3.	Preparing TV programs on: microorganism collection, botanical collection, and zoological collection.	From 2004 on	SB, EF	SBC, AS, MNP

IV

IMPLEMENTATION OF ACTION PLAN ON CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY

4.1. Financial Mechanism

National Biodiversity Strategy and Action Plan (NBSAP) implementation will be funded partially from the available sources. However, for the work implementation planned for the next 5 years, review of current financial mechanisms and providing of new financial sources is required. These measures will provide increase of investments and allow the NBSAP to be a self-financing process.

The Governmental Working Group (Resolution of the Tajik Government no. 77-p, December 29, 2000) will develop revised and renewed financial mechanisms and National Biodiversity and Biosafety Center will be responsible for coordinating work of donors through National Focal Point on biodiversity and developing contacts between donors and participating organizations. During 2003, National Biodiversity and Biosafety Center will need help from outside to create financial mechanisms and further on from environmental budget. Also, it will coordinate activities of participating organizations on providing effective use of funds by governmental bodies, NGOs, local authorities and communities, working on biodiversity conservation.

Below is a list of possibilities to provide financial mechanisms for NBSAP implementation.

The State Budget is quite limited and cannot cover all planned expenses for implementing activities on biodiversity conservation and organizing work on its sustainable use.

In spite of this, the state budget provides funds for maintaining reserves (zapovedniks and zakazniks), national parks, ecological departments, institutes of the Academy of Science (Institute of Botany, Institute of Zoology, Institute of Plant Physiology and Genetics, Pamir Botanical Institute); training specialists; providing forest conservation services, and a number of other

sectors working on biodiversity conservation and restoration. Considering the importance of bioresources and their role in combating poverty, the NBSAP implementation considers increasing budgetary assistance to National Biodiversity And Biosafety Center (NBBC). The basic value of bioresources for the economic and social development should be confirmed by distributing profit for biodiversity conservation and associated activities.

Republican Funds for Nature Protection. Using funds for particular purpose will improve the fund management. Later on, it can become important sources of funding of managing biodiversity and relevant actions, which are funded from internal sources (particularly penalties) and from use of biodiversity for commercial purposes.

Local Budgets. Implementing work at the local level will allow using local funds for nature protection to preserve biodiversity and promoting investments to bioresources management as well as establishing fares for biodiversity use.

Microcredits. Developing programs on microcredits, farmers in particular, will create additional possibility to fund mini-scale activities concerning both biodiversity conservation and economy.

Small Grants are particularly effective at the initial stage, including support for local initiatives; also, they can promote work on environmental protection both within communities and organizations.

FOOD FOR WORK programs. As a part of employment plan aimed at poverty alleviation at the local level, conservation of species habitats could be emphasized. This measure shows the capacity of employment in the sphere of environmental protection.

Funds, formed to liquidate the consequences of natural disasters. Methods of planting and slope fortification with trees and bushes

are considered one of the most effective means of the regulation of natural phenomena. At the same time, they are elements for restoring ecosystems and flora and fauna habitats.

Projects funded by donors. Considering a wide range of effective activities within NBSAP, including economic and social issues, problems of rural areas development and biodiversity conservation in general, there are many possibilities for close cooperation with various local and foreign donors during project implementation period. Important initial phase will require creating conditions within governmental bodies and NGOs to promote development of project concepts, proposals, applications for grants, and the project management according to the foreign donors' requirements.

The Global Environmental Facility. One of the main goals of the Facility is to manage biodiversity issues of global importance. This makes it possible to implement major projects. For this purpose, there is a series of financial mechanisms (including small and medium grant programs).

4.2. Funding Action Plan

To maintain the general state level of the environment, the expenses for nature protection should make up 6-7% of the GDP (gross domestic product), while to conserve the state of natural resources, they should be increased to 10% for areas with the disturbed environmental balance. According to the UN standards for developing countries, the capital investments in environment protection should be 0.8% of the GDP.

In 2000, the funds spent for environmental measures made 0.07% of the GDP. In the previous 5-year period (1995-2000), the annual average expenses were 0.034% of the GDP (table 4.1).

The total amount of expenses needed for the 10-year period of the Biodiversity Action Plan implementation is estimated at 67.8 million somoni (US\$26.6 million; prices of 2002), with annual expenses being over 5 million somoni (table 4.2).

The state budget share will be 35%. Funds from environmental foundations will make 10%. Some funds (20%) will be provided by other nature managers and economic institutions (land-users, forestry, NGOs, etc.) while implementing programs on sustainable development of particular economic branches supported by international investments and grants. The support of international financial structures and foreign donors (nearly 30-35%) will also be required (table 4.3).

The preliminary estimates show high efficiency of environmental measures. The time of justifying funds provided for environment protection will be less than the standard deadline fixed for branches of economy. This will provide the economic efficiency of environmental activities and promote the poverty alleviation.

The environmental costs could be minimized through update production technologies, sustainable management of natural resources, and development of economic incentives. The primary actions designed to overcome the negative tendencies in biodiversity require about 35% of the total funds.

Table 4.1. Expenditures on Environmental Protection and Sustainable Use of Natural Resources (current prices)*

Name	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Expenditures on environmental protection and sustainable use of natural resources, ths. somoni	28.9	436.1	5485	1794.1	43.9	151.7	169	179.8	149.6	1268.8
GDP, mln. somoni	13.4	64.5	707.1	1786.5	69.8	308.5	518.4	1025.2	1345.0	1806.7
For expenditures on environmental protection and sustainable use of natural resources in GDP, %	0.2	0.7	0.8	0.1	0.06	0.05	0.03	0.02	0.01	0.07

*Annual edition of Republic of Tajikistan for 2000 Dushanbe: State Statistic Committee, 2001. – P.148, 161.

The process of the Action Plan implementation suggests increasing the role of internal financing sources in biodiversity conservation, including those envisaged by the Law on Nature Protection but not completely used:

- Republican and local budgets;
- Specialized funds for environmental protection;
- Private funds of nature users;
- Contributions and donations made by private persons and organizations;
- Other financing sources not forbidden by the RT legislation;
- Compensatory payments (penalties) for non-sanctioned and inefficient management and the environment pollution causing its destruction.

Table 4.2. Funding Required for the Action Plan Implementation

2001 = \$1=2.55 somoni

No.	Actions	Terms of implementation	Cost							
			Total		Including					
					SB		LM		EF	
			ths. doll.	ths. somoni	ths. doll.	ths. somoni	ths. doll.	ths. somoni	ths. doll.	ths. somoni
1	2	3	4	5	6	7	8	9	10	11
1.	General Action Plan on Biodiversity Conservation	2003-2010	4283	10921	1008	2570	2508	6395	767	1956
2.	Creation National Ecological Network	2003-2010	745	1900	341	870	339	864	65	166
3.	Biodiversity Conservation at Geo-system Level	2003-2010	3995	10187	850	2168	2990	7624	155	395
4.	Conservation of Nival Glacier Ecosystems	2003-2010	1115	2843	493	1257	422	1076	200	510
5.	Conservation of High Mountain Desert Ecosystems	2003-2010	1922	4901	473	1206	1332	3397	117	298
6.	Conservation of High Mountain Meadow and Steppe Ecosystems	2003-2010	1885	4807	758	1933	1032	2632	95	242
7.	Conservation of Mid-mountain Conifer Forest Ecosystems	2003-2010	1038	2647	560	1428	455	1160	23	58
8.	Conservation of Mid-mountain Mesophyllic Forest Ecosystems	2003-2010	1223	3119	851	2170	372	949	-	-
9.	Conservation of Mid-mountain Xerophytic Light Forest Ecosystems	2003-2010	1415	3608	324	826	1091	2782	-	-
10.	Conservation of Mid- and Low-mountain Semisavanna (savannoide) Ecosystems	2003-2010	1069	2726	591	1507	448	1142	30	77
11.	Conservation of Foothill Semidesert and Desert Ecosystems	2003-2010	821	2093	366	933	455	1160	-	-
12.	Conservation of Wetland Ecosystems	2003-2010	1505	3838	814	2076	498	1270	193	492
13.	Biodiversity Conservation of Agroecosystems	2003-2010	2657	6776	710	1811	1947	4965	-	-
14.	Biodiversity Conservation in Urban Ecosystems	2003-2010	765	1951	718	1831	13	33	34	87
15.	Biodiversity Conservation <i>in-situ</i>	2003-2010	1452	3703	329	839	634	1617	489	1247
16.	Biodiversity Conservation outside natural habitats (<i>ex-situ</i>)	2003-2010	690	1759	136	347	283	722	271	691
Total :			26580	67778	9322	23771	14819	37788	2439	6219

Table 4.3. Expenditures Chart on Biodiversity Conservation in the Context of Ecosystems (%)

No.	Actions	Cost			
		Total	Including		
			SB	LM	EF
1.	General Action Plan on Biodiversity Conservation	16.1	10.8	16.9	31.4
2.	Creation National Ecological Network	2.8	3.7	2.3	2.7
3.	Biodiversity Conservation at Geosystem Level	15.0	9.1	20.2	6.4
4.	Conservation of Nival Glacier Ecosystems	4.2	5.3	2.8	8.2
5.	Conservation of High Mountain Desert Ecosystems	7.2	5.1	8.9	4.8
6.	Conservation of High Mountain Meadow and Steppe Ecosystems	7.1	8.1	7.0	3.9
7.	Conservation of Mid-mountain Conifer Forest Ecosystems	3.9	6.0	3.1	0.9
8.	Conservation of Mid-mountain Mesophyllic Forest Ecosystems	4.6	9.1	2.5	–
9.	Conservation of Mid-mountain Xerophytic Light Forest Ecosystems	5.3	3.5	7.4	–
10.	Conservation of Mid- and Low-mountain Semisavanna (savannoide) Ecosystems	4.0	6.3	3.0	1.2
11.	Conservation of Foothill Semidesert and Desert Ecosystems	3.1	3.9	3.1	–
12.	Conservation of Wetland Ecosystems	5.7	8.7	3.4	7.9
13.	Biodiversity Conservation of Agroecosystems	10.0	7.6	13.1	–
14.	Biodiversity Conservation in Urban Ecosystems	2.9	7.7	0.1	1.4
15.	Biodiversity Conservation <i>in-situ</i>	5.5	3.5	4.3	20.1
16.	Biodiversity Conservation outside natural habitats (<i>ex-situ</i>)	2.6	1.5	1.9	11.1
Total:		100.0	100.0	100.0	100.0

Table 4.4. Means Allocation According to the Activities (summary on ecosystems)

Measures	Total	Including		
		SB	LM	EF
1. Improvement of policy, legislative and institutional base (ths. \$US):	1989	1039	462	488
Same in % to horizontal total	100.0	52.2	23.2	24.5
Same in % to vertical total	7.5	11.2	3.1	20.0
2. Research and monitoring (ths. \$US)	7241	2445	4106	690
Same in % to horizontal total	100.0	33.8	56.7	9.5
Same in % to vertical total	27.2	26.2	27.7	28.3
3. Territorial planning, biodiversity conservation programs (ths. \$US)	13334	4160	8316	858
Same in % to horizontal total	100.0	31.2	62.4	6.4
Same in % to vertical total	50.2	44.6	56.1	35.2
4. Education of the population. Informative-educational measures (ths. \$US)	3277	1403	1599	275
Same in % to horizontal total	100.0	42.8	48.8	8.4
Same in % to vertical total	12.3	15.0	10.8	11.3
5. Fostering of the funding support mechanisms (ths. \$US)	255	138	75	42
Same in % to horizontal total	100.0	54.1	29.4	16.5
Same in % to vertical total	1.0	1.5	0.5	1.7
6. Information, coordination, creation of clearing-house mechanism (ths. \$US)	319	84	159	76
Same in % to horizontal total	100.0	26.3	49.8	23.8
Same in % to vertical total	1.2	0.9	1.1	3.1
7. International cooperation (ths. \$US)	165	53	102	10
Same in % to horizontal total	100.0	32.1	61.8	6.1
Same in % to vertical total	0.6	0.6	0.7	0.4
8. Total all expenses (ths. \$US)	26580	9322	14819	2439
Same in % to horizontal total	100.0	35.1	55.8	9.1
Same in % to vertical total	100.0	100.0	100.0	100.0

The greatest part of the expenses is spent on mountain reforestation, making about 40% (table 4.4) of the total funds.

The greatest part of the activity funding structure is occupied by area planning and biodiversity conservation programs – 50.2%; research and monitoring – 27.2%, informational and educational measures, environmental education of population – 12.3%, and improvement of policy, legislation, and intellectual base – 7.5%. These activities provide creation of a national ecological network, implementation of comprehensive research and monitoring, and biodiversity inventory. The following activities require particularly great expenses: improving the legislative and institutional base; introducing new technologies and improving management; organizing expeditions and providing update high-precision devices and equipment for laboratory analyses, expertise, and other investigations, as well as computers.

4.3. Economic mechanisms and means for Action Plan implementation

Economic mechanisms should promote economic activities to create conditions stimulating sustainable management of natural resources, particularly biodiversity conservation.

The key elements of economic mechanism on biodiversity conservation are:

- a) using taxation on favorable terms for measures on biodiversity conservation (exemption from land tax on private areas, provided for creating forest shelter-belts, reduction of income tax in case of waste utilization, reduction of taxes for credits aimed at environmental activities, etc.);
- b) introducing special taxes (duties) on processes that affect biodiversity (taxation of investments on roads construction, electricity transmission lines, etc. in state protected areas);
- c) introducing mechanism of compulsory insurance of technologies that affect the environment;
- d) using favorable terms of crediting for measures on biodiversity conservation (through bank percentage guaranteed by the Ecological Facility);
- e) providing quota for by-products gathered within natural ecosystems, at least 5% of the maximum cost of related products received in cultivated areas;



Barzangi Mountains

- f) using the received funds for biodiversity conservation and sustainable management;
- g) introducing payment for entering (visiting, crossing) protected areas and parking in specially organized sites, etc.

4.4. International Support

Measures on biodiversity conservation are subdivided into five categories, according to the decision-making level: global, interregional, regional, national, and local. Implementing measures of particular category requires participation of parties concerned at particular level.

Mountain systems and protected areas are objects of global interest and management.

International support is needed to create national environmental network, conserve endangered species, develop new schemes of nature management in protected areas, work out new tools of economic management, organize specialized monitoring, make biodiversity inventory, organize informational and educational work, improve a legislative and institutional capacities, introduce economic mechanisms of conserving environment, and develop new technologies.

Work on creation of biosphere reserves in Tajikistan and including these in continuous green corridors requires international cooperation and support.

4.5. Actions on Biodiversity Conservation in particular regions

The implementation of the Action Plan on biodiversity conservation requires differentiation of the regional policy of biodiversity conservation.

Considering the environmental state of the country, the biodiversity conservation and sustainable management should be organized and

provided in view of particular natural and environmental areas, where unique species, valuable communities, ecosystems, and geosystems are preserved under various anthropogenic impact. Analyzing the state of ecosystems, plant communities, floristic and faunal associations, and evaluating their composition and structure, animal migration routes, habitats and populations of rare and endemic species made it possible to identify priorities of biodiversity conservation by evaluating method.

From this point of view, **foothill plain landscapes** (geosystems) are most intensively used areas with degraded vegetation. The vast territories of southwestern and northern Tajikistan (Syrdarya, Kafirnigan, Vakhsh, Kulyab oases, and Hissar Valley) are characterized by fragmentation of geosystems and ecosystems, and impoverishment of valuable plant communities in structure and composition. A lot of unique plant and animal species changed, small wild nature areas being preserved. It is necessary to create environment-stabilizing areas, exclude the degraded areas from agricultural lands and restore wild plants and fauna, reduce arable areas, increase the percentage of perennial and mixed crops in the agrophytocenosis structure, etc. To regulate the ecosystem balance will be possible only if the area management structure is changed.

Low-Mountain and Plain Landscapes (geosystems) are intensively used for rain-fed and partly irrigable agriculture. They cover the areas of the Mogoltau-Kuramin Range, low-mountain areas of the Turkestan and Zeravshan ranges (northern Tajikistan), river valleys of the southern Hissar, Karategin, and Vakhsh ranges, and Khazratishoh Range (Central Tajikistan).



Hills



Childukhtaron Mountains

Here, a considerable transformation of the geosystem, destruction of ecosystem composition, and reduction of valuable communities and species areas occur.

Natural ecosystems are still preserved within the low-mountain and plain landscapes; however their functions are considerably disturbed. Conservation efforts should be aimed at solving problems at the ecosystem level, with the functions of major natural ecosystems being restored.

Mid-Mountain Light Forest and Forest Landscapes (geosystems) are used for cattle grazing and rain-fed agriculture (Central Tajikistan). Here, forested areas are being considerably reduced, valuable community composition is being degraded and partial introduction of alien and weed plants occurs.

Within the mid-mountain light forest and forest landscape zone, where sustainably functioning natural ecosystems occupy considerable area, efforts on biodiversity conservation should be aimed mainly at species conservation:

- organizing protected areas and biota migration corridors;
- restoring destructed habitats of endangered species;
- reproducing rare species and returning these in their natural areas;
- regulating abundant species according to area capacity.

Special attention should be given to the valuable plant community areas and fauna habitats, considering their restoration, conservation, and monitoring at the national, regional, and international levels.

The protected areas contain limited number of rare animal and plant habitats. Most of them are located outside the State Forest Re-

sources areas. These areas are allotted to economic bodies. The flora and fauna of the Romit, Tigrovaya Balka, and Dashti-Jum zapovedniks, the Varzob and Yakhsu River valleys, lakes and reservoirs (Nurek, Kairakkum, etc.) are endangered.

High-Mountain Landscapes (geosystems) with desert and steppe vegetation, combined with alpine meadows, intensively used by people, are partly choked with weeds and need regulated grazing and undertaking biotechnical measures on pastures.

High-Mountain Snow-Glacier Landscapes (geosystems) with sparse vulnerable vegetation need regulating all kinds of tourist activities.

4.6. Coordinating and organizing monitoring of Strategy introduction process

To introduce the Strategy of biodiversity conservation, coordination body and operational and institutional unit should be created with participation of the Governmental Working Group and NBBC.

The coordination body will discuss work on meeting the commitments of Republic of Tajikistan under the Convention on Biological Diversity and approving relevant regulations and programs.

The operational and institutional unit will be NBBC. It will coordinate actions on biodiversity conservation, develop a concept of national clearing-house mechanism (to simplify interaction and exchange of information), mechanisms of collecting, providing access to, and exchange of information, and relevant regulations; and determine informational gaps. One of the trends in the activities of NBBC will include actions on biodiversity conservation in branch working plans, introducing economic mechanisms. NBBC will implement work on creating database on biodiversity of flora, fauna and microorganisms, ecosystems, and landscapes. NBBC will also attract donors to projects on biodiversity conservation; create informational base, and organize monitoring of biodiversity strategy introduction; develop national report on the biodiversity state and management to be submitted to the Conference Parties of the Convention on Biological Diversity, and annual reports for internal use; and make

analysis, evaluation, and expertise of materials on mountain biodiversity, mountain ecosystems, biotechnologies, biosafety, etc.

NBBC will work on international cooperation by developing national concept of equally accessible biotechnologies, distributing resources and income at the international level, determining trends and developing programs on international cooperation, working out a plan for ratification of international conventions and agreements on biodiversity conservation, developing regulations on limiting import and export of rare and endangered species, ensuring biological security, using biotechnologies and genetically modified organisms. NBBC's activities will also include the development of toolkits and regulations on implementing research work on biodiversity within the territories of Republic of Tajikistan by national and foreign experts.

The effective implementation of National Strategy and Action Plan on biodiversity conservation will help to conserve biodiversity and stabilize the ecological situation in Republic of Tajikistan.

4.7. Strategy Monitoring and Evaluation

Monitoring and evaluation are integral parts of the strategy implementation process; they assess the effectiveness of the actions planned, help to avoid work duplication, use the experience stored, and allows plan corrections, when situation has changed.

NBSAP monitoring and evaluation will be based on using available structures and information.

It will be implemented as follows:

- Participating organizations will provide monitoring of implementation progress in particular activities according to objectives and results stated by a NBSAP.
- The Governmental Working Group in cooperation with NBBC will be responsible for collecting information on actions implementation within NBSAP from participating organizations and provide general review of the strategy implementation progress.
- Results of monitoring and evaluation will be widely distributed through various reporting systems within strategy and campaigns on the public informing.

Reporting Instructions

Reports on NBSAP implementation should be submitted systematically and conform to its purpose and specific character of users.

The major reports are:

- *Annual National Report on the activities implemented.* It is prepared for initial discussion on strategy implementation. This report should include the detailed description of actions carried out, with their progress and results being indicated. The report is submitted to decision-making bodies, donors, NGOs, scientific and business circles, and other project participants.
- *Report on project progress for the public.* This is a brief review of national report; it is prepared in intelligible form for the public, as well as for wide range of groups and persons, interested in biodiversity issues and in the project implementation, and mass media.
- *International report on implementation of the Convention on Biological Diversity.* Submitted to the Secretariat of the Convention according to the national commitments under the Convention. International reports will be based on information contained in national reports according to the toolkit provided by the Secretariat.

Table 4.5. Reporting instructions

Report type	Content	Person/agency to report	Where to submit reports	How often
Annual	Detailed review of strategy implementation for year, corrected plans for the next year	Governmental Working Group (GWG), NBBC	Main participating organizations; Main financing organizations; Other organizations, closely related to NSBAP	Annually
Materials of seminars, conferences, and meetings	Final reports: Work progress, planning, financing, general situation, etc. from the GWG; Recommendations on plan correction	NBBC	Governments, organizations concerned	Each meeting
Annual report to the public	Brief and adapted version of total annual report	NBBC	Participating organizations The public International parties concerned Mass media	Annually
Reports on sectors/problems (if necessary)	Detailed reports of experts on key sectors or issues according to GWG requirements, containing: Correction and analysis of information available; Progress review within sector; Progress evaluation; Recommendations on further work and plan correction	Technical consultants	GWG	Annually
National report to the CBD	Modified version of annual report, with focus on the progress in the CBD articles implementation on national scale	NBBC Ministry for Nature Protection	CBD Secretariat CBD participants	Annually
NBSAP reports	Reporting on NBSAP implementation for organizations coordinating/included in NBSAP. Based on the annual report	NBBC and relevant governmental agencies	Other countries/ organizations, planning and implementing NBSAP	When required
Other international reports	Reporting for other conventions, agreements, and organizations working on this problem. Based on the annual report	NBBC and relevant organizations	Relevant international organizations	When required
Reports to financing organizations	Any organization financing NBSAP activities can ask for reports on work progress, probably in addition to the annual report and reports on activities.	Participating organizations and NBBC	Financing organization	When required
Final report	Detailed review of NBSAP implementation, on which renewed NBSAP should be based	NBBC, GWG and all parties concerned	All organizations participating in NBSAP	By the end of 5-year period

- *Final report on Strategy implementation.* Final review of strategy implementation is prepared by the end of each five-year period; this is a review of achievements for reporting period, analyzing successes or failures occurred in the process of the original plan implementation, as well as recommendations for further planning on biodiversity issues, based on the experience gained (table 4.5)

Basic Principles of Project Co-ordination Structures

The general structures of project implementation are:

- based on the current GWG and established NBBC;
- efficient in terms of required resources and personnel;
- based on self-financing principle, with the above requirements being considered;
- based on long-term internal financial sources.

Strategy Management and Action Plan Implementation

Project will be realized by a wide range of organizations and agencies. Essential role in NBSAP implementation is given to NBBC, Ministry for Nature Protection, Tajik Forest Production Enterprise, State Land Committee, and Government. NBSAP implementation will be supported by available and new financial mechanisms.

The Governmental Working Group (GWG) having the experience of project and information management is independent to make assessments and realize monitoring. It does not implement the activity related with NBSAP and biosafety. National Focal Point and National Biodiversity and Biosafety Center coordinate with mayor participating organizations and form the structure and staff of executing bodies of conservation and sustainable use of biodiversity and biosafety in accordance with the Statement of Government of the Republic of Tajikistan.

NBSAP management structure is supposed to function as follows:

- coordinating work on NBSAP implementation (to avoid duplication or repetition);
- encouraging the involvement of wider range of organizations in NBSAP implementation, including possible investors;



Mountain stream

- promoting contacts between possible participating agencies and appropriate financial mechanisms;
- examining the activity affecting biodiversity and biosafety;
- determining needs and providing specific contribution in training and technical support, if possible as well as presenting certificates of qualification;
- keeping and disseminating information on NBSAP implementation;
- developing decision-making systems on biodiversity and risk assessment on biosafety;
- discussing and evaluating NBSAP progress annually;
- providing evaluation and conclusion on use of biodiversity including flora and fauna species listed in Red Data Book;
- updating regularly the National Report in accordance with the requirements of Secretariat of the Convention;
- planning the progress of a country's ecological network and participate in regional planning of econet;
- disseminating information on NBSAP implementation both on local and international levels;
- forming structure of decision-making on GMO, biodiversity conservation, plants protection from invasive species;

The National Center should organize its work in five key directions, which provide managing and administrating processes of biodiversity conservation and providing biosafety:

1. Coordination Committee: controlling general process of Strategy implementation through the following functions:

- providing support for participating organizations in fundraising and project implementation;

- coordinating financial mechanisms operation for NBSAP;
- collecting information on NBSAP;
- coordinating all levels of NBSAP planning;
- assessing the process of NBSAP implementation together with the Working Group on providing technical support;
- providing annual review of NBSAP implementation;
- disseminating and publishing information on NBSAP;
- promoting interaction of all parties participating in NBSAP implementation.

2. National Commission on Biological Safety including scientific organizations and National Focal Point on Biodiversity and Biosafety (Chairman) and representatives of stakeholders.

Its activity include:

- Coordinating of works on Biosafety
- Developing of project documents
- Consideration of applications on introduction of GMO
- Making contacts with international organizations.
- The Commission attracts experts from Ministry on Nature Protection, Ministry of Health Protection, Ministry of economy and trade, scientific institutions to participate in decision-making and conclusion.

3. Scientific Expert Council is to support the project at the highest level, determine priorities and trends of project activities:

- projects expertise concerning biodiversity conservation and biosafety;
- meeting on monitoring NBSAP implementation progress;
- preparing feasibility study of projects on biodiversity and biosafety;
- public awareness campaign;
- analysis and assessment of all kinds of work in biodiversity and biosafety sectors

The Council will involve officials, governmental and business circles, NGOs, and Academy institutes, which are interested in providing independent support (consulting) for projects.

NBSAP Implementing agencies are:

4. Organizational analytical Working Group will take part in evaluating information and assess technical aspects of project implementation, together with scientists and mass media representatives, who can pay more attention on the evolutionary and estimating processes. It

provides coordination of realization of NBSAP financial mechanisms.

4. Information -technical Group will create database and be responsible for:

- Regular assessment of NBSAP implementation, biodiversity and biosafety state;
- Preparing of annual report on NBSAP implementation and other works on biodiversity and Biosafety;
- collecting information;
- independent monitoring and evaluation of NBSAP implementation in particular areas;
- providing general reviews;
- providing training on necessary activities, including submitting applications for grants;
- disseminating and publishing of information on biodiversity and biosafety;
- creating database on biodiversity and biosafety and web-site.

Participating organizations

To provide effective implementation of NBSAP, NBBC will need to maintain contacts with major participating organizations:

- **Governmental institutions, including:**

- Governmental Working Group
- Ministry for Nature Protection
- Tajik Forest Production Enterprise
- Ministry of Agriculture
- State Land Use Committee
- Ministry of Finance
- Ministry of Economy and Trade
- Ministry of Health Protection

- **Local Authorities, including:**

- Regions
- Districts
- Community representatives

- **Institutions, including:**

- Academy of Science; branch Institutes
- Universities, schools
- Tajik Academy of Agricultural Science

- **Mass Media, including:**

- National and local newspapers
- National and local TV
- National and local radio

- **National and international environmental initiatives, including:**

- Action program on improving the environmental and economic and social situation in the Aral Sea Basin
- Agricultural projects
- Project on NBF preparation

- NGOs, working on:

- Environmental protection
- Rural areas development
- Education
- Renewable energy
- International sector

The main direction of the Governmental Working Group's work at the organizational stage of NBSAP implementation will be: coordinating all activities and avoiding any work duplication. The work on coordination and integration will be based on distribution of information through the mediation mechanism envisaged by a project.

Considering some difficulties, connected with the lack of investments for the infrastructure, the GWG's work will be based on using available resources and technical means. Also, methods of partnership construction and creating atmosphere of close cooperation between various institutions, organizations, and agencies, worked out in the process of Strategy development, will be applied. The developed model of the integrated approach to biodiversity management will be widely applied.

The main problems were determined by national experts and discussed at 2 conferences, with experts from ministries, research institutions, and NGOs taking part.

The main objective of the Strategy is to identify the premises of preserving geosystems, ecosystems, and species for further generations, as well as to create the basis for sustainable management of natural resources and sustainable development of social and economic systems.

The Action Plan is developed to reach the main objective of the Strategy on biological diversity conservation. The plan consists of numerous sub-plans with separate goals (e.g. creating an ecological network, conserving forest ecosystems); each sub-plan is developed according to a particular activity in 4 fields: legislative and institutional framework, area planning and biodiversity conservation, research and monitoring; providing information and education.

The terms of implementation does not exceed 10 years. The Action Plan determines financing sources and other organizations responsible for its implementation.

Action Plan Implementation. The cost is US\$26.6 m, including \$9.3 m for priority actions. Financing sources are: state budget, national and local ecological foundations. The support of international donors is also required.

National Biodiversity and Biosafety Center is responsible for the Action Plan implementation. The first priority of the Action Plan implementation is further development of the legislative base for regulating activities in all branches of national economy.

The second priority is the re-orientation of the environmental policy to agriculture, forestry, and other sectors.

The third priority is establishment of the National Ecological Network. This process will contribute to the biodiversity conservation and environmental balance sustainability at the regional and local levels.

Evaluation of Biodiversity Conservation Problems

These problems were evaluated by the ecosystem approach and comparative analysis of their priority and complexity, with 7 criteria (biodiversity level, environment degradation, economic losses, problem solvability, results of rehabilitation process, area distribution, monitoring level) being used.

The evaluated problems were systematized according to the way of biodiversity conservation and action level (geosystems, ecosystems, etc.).

The following primary problems were determined as a result of biodiversity state and tendencies evaluation:

1. disturbance of landscape environmental balance;
2. degradation of natural ecosystems (forest, steppe, meadow, water);
3. reduction of species diversity and biocenoses impoverishment;
4. degradation of flora and wild animal genetic resources, and reduction of agricultural crops;
5. destruction of wild plant and animal migration routes;
6. low level of environmental education.

ANNEXES

Table 1. Biodiversity State Assessment and Bioresources Conservation Issues

Categories of assessment	Priority				Complexity					
Assessment criteria	Biodiversity loss	Environmental degradation	Economic loss	Total	Ways of solution	Environment conservation	Areas distribution	Regulation level	Total	
Coefficient	0,5	0,3	0,2		0,4	0,3	0,2	0,1		
1	1	2	3	4	5	6	7	8	9	10
IN-SITU CONSERVATION										
1. Geosystem level										
1.1. Ecobalance degradation in foothill-valley zone	3 1,5	3 0,9	3 0,6	3,0	1 0,4	3 0,9	2 0,2	1 0,1	1,6	
1.2. Pasture biodiversity degradation in low-mountain zone	3 1,5	2 0,6	3 0,6	2,7	2 0,8	1 0,3	2 0,4	2 0,2	1,7	
1.3. Decrease in species number	3 1,5	2 0,6	2 0,4	2,5	2 0,8	2 0,6	3 0,6	2 0,2	2,2	
1.4. Ecosystems reorganization	3 1,5	3 0,9	3 0,6	3,0	1 0,4	2 0,6	2 0,4	2 0,2	1,6	
1.5. Wetland ecosystems degradation	2 1,0	2 0,6	1 0,2	1,8	2 0,8	2 0,6	3 0,6	1 0,1	2,1	
1.6. Degradation of landscape in reserves	2 1,0	2 0,6	1 0,2	1,8	2 0,8	3 0,9	1 0,2	2 0,2	2,1	
1.7. Degradation of the protected areas structure	2 1,0	2 0,6	1 0,2	1,8	2 0,8	3 0,9	1 0,2	2 0,2	2,1	
1.8. Partial degradation of mountain landscapes	1 0,5	2 0,6	2 0,4	1,5	1 0,4	2 0,6	2 0,4	1 0,1	1,5	
1.9. Reorganization and degradation of landscape in the light forests extension zone	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,2	2,5	
1.10. Partial degradation of alpine and subalpine landscapes structure	2 1,0	2 0,6	2 0,4	2,0	1 0,4	2 0,6	2 0,4	1 0,1	1,5	
1.11. Eutrophication of watercourses	1 0,5	2 0,6	2 0,4	1,5	2 0,8	2 0,6	3 0,6	2 0,2	2,2	
1.12. Urban landscapes degradation	3 1,5	2 0,6	1 0,2	2,3	1 0,4	2 0,6	3 0,6	1 0,1	1,7	
1.13. Degradation of high-mountain steppe zones	2 1,0	2 0,6	2 0,4	2,0	2 0,8	2 0,6	2 0,4	1 0,1	1,9	

Table 1 continued

1	2	3	4	5	6	7	8	9	10
2. Ecosystem level									
2.1. Complete degradation of tugai ecosystems	3 1,5	2 0,6	2 0,4	2,5	1 0,4	2 0,6	2 0,4	1 0,1	1,5
2.2. Reorganization of desert and semidesert ecosystems	3 1,5	3 0,9	3 0,6	3,0	1 0,4	2 0,6	2 0,4	1 0,1	1,5
2.3. Degradation of savannoide ecosystems	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,2	2,5
2.4. Degradation and reorganization of xerophytic light forests	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,2	2,5
2.5. Reorganization of mesophyllic forests ecosystems	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,2	2,5
2.6. Reduction in area of conifer forest ecosystems	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,2	2,5
2.7. Reduction of productivity and introduction of invasive species into meadow-steppe ecosystems	2 1,0	3 0,9	2 0,4	2,3	2 0,8	3 0,9	3 0,9	2 0,2	2,5
2.8. Degradation of high-mountain desert ecosystems	3 1,5	3 0,9	2 0,4	2,8	2 0,8	3 0,9	2 0,4	2 0,2	2,3
2.9. Lack of detailed classification of ecosystems of Tajikistan	2 1,0	2 0,6	1 0,2	1,8	3 1,2	2 0,6	3 0,6	3 0,3	2,7
2.10. Pollution of nival ecosystems by waste	3 1,5	1 0,3	1 0,2	2,0	3 1,2	1 0,3	1 0,2	2 0,2	1,9
2.11. Degradation of ecological balance in agroecosystems	3 1,5	2 0,6	3 0,6	2,7	2 0,8	3 0,9	3 0,6	2 0,2	2,5
3. Specific level									
3.1. Reduction of species natural habitats	3 1,5	2 0,6	3 0,6	2,7	2 0,8	2 0,6	3 0,6	2 0,2	2,2
3.2. Reduction of specific number of foothill and low-mountain ecosystems	3 1,5	3 0,9	3 0,6	3,0	2 0,8	2 0,6	3 0,6	2 0,2	2,2
3.3. Reduction of specific number of and high-mountain desert ecosystems	2 1,0	1 0,3	2 0,4	1,7	2 0,8	3 0,9	3 0,6	2 0,2	2,5
3.4. Reduction of specific number of rare endemic flora and fauna species	3 1,5	3 0,9	2 0,4	2,8	2 0,8	3 0,9	3 0,6	2 0,2	2,5
3.5. Degradation of migration corridors of species in all landscape units.	2 1,0	3 0,9	2 0,4	2,3	2 0,8	2 0,6	2 0,4	1 0,1	1,9
3.6. Reduction in area of valuable communities and their diversity	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,2	2,5
3.7. Extension of alien and invasive flora and fauna species introduction	2 1,0	3 0,9	3 0,6	2,5	2 0,8	2 0,6	3 0,6	2 0,2	2,2
3.8. Reduction in relic flora and fauna species	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,2	2,5
3.9. Degradation of game species and their resources	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,2	2,5
4. Genetic level									
4.1. Reduction in area of wild relatives of fruit plants	3 1,5	3 0,9	3 0,6	3,0	3 1,2	3 0,9	3 0,6	2 0,2	2,9
4.2. Degradation of wild relatives of cultural and medicinal plants	3 1,5	2 0,6	3 0,6	2,7	2 0,8	3 0,9	3 0,6	2 0,4	2,7
4.3. Reduction of number of wild relatives of domestic animals	3 1,5	3 0,9	2 0,4	2,8	2 0,8	3 0,9	3 0,6	2 0,4	2,7

Table 1 continued

1	2	3	4	5	6	7	8	9	10
4.4. Reduction in number of ungulates populations	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,4	2,7
4.5. Reduction in number of valuable plants species	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	3 0,6	2 0,4	2,7
4.6. Reduction in number of snow leopard population	3 1,5	3 0,9	1 0,2	2,6	2 0,8	2 0,6	2 0,4	2 0,4	2,2
EX-SITU CONSERVATION									
5. Genetic problems									
5.1. Degradation of genetic pool of indigenous breeds of animals	3 1,5	1 0,3	3 0,6	2,4	2 0,8	1 0,3	2 0,4	2 0,2	1,7
5.2. Loss of some indigenous varieties of fruit, melon and food cultures.	3 1,5	2 0,6	3 0,6	2,7	2 0,8	1 0,3	1 0,2	2 0,2	1,5
5.3. Degradation of genetic pool of cultural plants	3 1,5	2 0,6	3 0,6	2,7	2 0,8	2 0,6	2 0,4	1 0,1	1,9
5.4. Reduction of genetic pool of mountain varieties of oil-bearing, food and forage plants	3 1,5	3 0,9	3 0,6	3,0	2 0,8	3 0,9	2 0,4	1 0,1	2,2
5.5. Lack of catalogue and databases on <i>in-situ</i> species	3 1,5	1 0,3	2 0,4	2,2	2 0,8	1 0,3	2 0,4	2 0,2	1,7
6. Organizational problems									
6.1. Lack of funding and financial-technical provision of <i>ex-situ</i> problems	3 1,5	2 0,6	1 0,2	2,3	2 0,8	1 0,3	2 0,4	1 0,1	1,6
6.2. Lack of monitoring system on flora and fauna GMO	3 1,5	2 0,6	3 0,6	2,7	2 0,8	3 0,9	3 0,6	2 0,2	2,5
6.3. Insufficient use of <i>ex-situ</i> methods for wild biota conservation	3 1,5	2 0,6	3 0,6	2,7	2 0,8	3 0,9	3 0,6	2 0,2	2,5

Table 2. Implementation Terms of the Biodiversity Conservation Strategy Components

Implementation period	Conservation level	Strategy components	
		Priority	Other
Short-term	Species		S ₆
	Genetic	V ₁ , V ₂ , V ₄	V ₅
	<i>Ex-situ</i>	ExS ₂	ExS ₃
Mid-term	Geosystem	G ₃ , G ₄ , G ₈	
	Ecosystem	E ₁ , E ₃ , E ₈	E ₁₀
	Species	S ₁ , S ₃	S ₄
	<i>Ex-situ</i>	ExS ₁ , ExS ₄	
Long-term	Geosystem	G ₁ , G ₂	G ₇
	Ecosystem	E ₂	
	Species	S ₅	S ₈

Table 3. List of Species of Global, Regional, National and Local Significance Requiring Priority Protection

No.	Latin Names	Included in IUCN	Global	Regional	National	Local	SITES	IUCN categories
1	2	3	4	5	6	7	8	9
FUNGI								
1.	<i>Aspicilia oxneriana</i> Zer.		+					
2.	<i>Battarea phalloides</i> Pers.					+		2
3.	<i>Pleurotus komarnitzkyi</i> Vassilk.						+	2
4.	<i>Morchella steppicola</i> Zer.		+				+	2
5.	<i>Polyporus rhizophilus</i> Pat.					+		2
BRUOPHYTA								
6.	<i>Barbula decurrens</i> Lazar.		+					
7.	<i>Barbula johansenii</i> Williams			+				1
8.	<i>Weisia papillosissima</i> Lasar.			+				3
9.	<i>Hydrogonium mamatkulovii</i> Lazar.		+					
10.	<i>Hymenostomum papillosissimum</i> Lazar.		+					
11.	<i>Desmatodon altipes</i> Broth.			+				2
12.	<i>Indusiella thianschaica</i> Broth. et C. Muell.		+					1
13.	<i>Mielichhoferia himalayana</i> Mitt.			+				1
14.	<i>Tortula afanassievii</i> Lazar.		+				+	
15.	<i>Tortula ferganensis</i> Lasar.		+					2
16.	<i>Usmania campylopoda</i> Lazar.		+				+	1
17.	<i>Phascum vlassovii</i> Lazar. (<i>Lydiaea vlassovii</i> Lazar.)		+					
18.	<i>Fissidens karataviensis</i> Sams.			+				2
PTERIDOPHYTA								
19.	<i>Gymnocarpium fedtschenkoanum</i> Pojark			+				2
20.	<i>Asplenium pseudofontanum</i> C. Koss.			+				0,1
21.	<i>Cryptogramma stelleri</i> (S. G. Gmel.) Prantl.			+				0
22.	<i>Ophioglossum bucharicum</i> O. et B. Fedtsch.			+			+	2
23.	<i>Dryopteris thelypteris</i> (L.) F. Gray			+				1
24.	<i>Dryopteris komarovii</i> C. Koss.			+				1
GYMNOSPERMAE								
Cupressaceae								
25.	<i>Juniperus schugnanica</i> Kom.				+			
26.	<i>Thuja orientalis</i> L.				+			1
Ephedraceae								
27.	<i>Ephedra pulvinaris</i> V. Nikit.			+				
ANGIOSPERMAE								
Poaceae Gramineae								
28.	<i>Puccinellia akbaitalensis</i> Ovcz. et Czuk.			+				

Table 3 continued

1	2	3	4	5	6	7	8	9
29.	<i>Puccinellia vachanica</i> Ovcz. et Czuk.					+		
30.	<i>Bromopsis pamirica</i> (Drob.) Holub					+		
31.	<i>Calamagrostis korshinskyi</i> Litv.				+			
32.	<i>Calamagrostis grandiflora</i> Hack.			+				
33.	<i>Calamagrostis schugnanica</i> Litv.					+		
34.	<i>Elymostachys badachschanica</i> Tzvel.					+		
35.	<i>Elymostachys grigorievii</i> Tzvel.			+				
36.	<i>Stipa badachschanica</i> Roshev.				+			
37.	<i>Stipa longiplumosa</i> Roshev.				+			
38.	<i>Stipa ikonnikovii</i> Tzvel.			+			+	
39.	<i>Stipa ovczinnikovii</i> Roshev.				+			
40.	<i>Stipa pamirica</i> Roshev.					+		1
41.	<i>Stipa turkestanica</i> Hack.			+			+	
42.	<i>Stipa jagnobica</i> Ovcz. et Czuk.					+		2
43.	<i>Zerna gontscharovii</i> Boriss.			+				
44.	<i>Zerna paulsenii</i> (Hack.) Nevski				+			
45.	<i>Littledalea alaica</i> (Korsh.) V. Petr.			+				
46.	<i>Alopecurus mucronatus</i> Hack.			+			+	
47.	<i>Malacurus lanatus</i> (Korsh.) Nevski			+				
48.	<i>Poa dispansa</i> Ovcz.			+				
49.	<i>Poa tremuloides</i> Litv.			+				
50.	<i>Poa karateginensis</i> Roshev.					+	+	
51.	<i>Poa pseudotremuloides</i> Ovcz. et Czuk.				+			
52.	<i>Poa pseudodisiecta</i> Ovcz.				+			
53.	<i>Poa lubrica</i> Ovcz.				+			
54.	<i>Poa acuticaulis</i> Ovcz. et Czuk.				+		+	
55.	<i>Poa contracta</i> Ovcz. et Czuk.			+				
56.	<i>Poa articulata</i> Ovcz.				+			
57.	<i>Piptatherum tremuloides</i> Ovcz. et Czuk.			+				
58.	<i>Piptatherum hilariae</i> Paz.				+			
59.	<i>Piptatherum purpurascens</i> (Hack.) Roshev.				+			
60.	<i>Piptatherum aequiglume</i> (Hook. fil.) Roshev.			+				
61.	<i>Piptatherum fedtschenkoi</i> Roshev.				+			
62.	<i>Helictotrichon hissaricum</i> (Roshev.) Hern.				+			
63.	<i>Festuca pseudogigantea</i> Ovcz. et Schibk.			+			+	
64.	<i>Festuca squamulosa</i> Ovcz. et Schibk.				+			
65.	<i>Agrostis pamirica</i> Ovcz.					+		
66.	<i>Agrostis paulsenii</i> Hack.					+		
67.	<i>Elytrigia repens</i> Nevski in Nouv			+				
68.	<i>Elymus badachschanicus</i> (Tzvelv). Ikonn.				+			
69.	<i>Pentatherum linczevskii</i> Kudr.			+				
70.	<i>Secale silvestris</i> Host			+				
71.	<i>Roegneria carinata</i> Ovcz. et Sidor.				+		+	
72.	<i>Roegneria macrochaeta</i> Nevski				+			
73.	<i>Roegneria lachnophylla</i> Ovcz. et Sidor.				+			
74.	<i>Hordeum bulbosum</i> L.		+					
75.	<i>Hordeum jubatum</i> L.			+				

Table 3 continued

1	2	3	4	5	6	7	8	9
Cyperaceae								
76.	<i>Carex bucharica</i> Kük.				+			3
Liliaceae								
77.	<i>Bellevalia inconspicua</i> Vved.				+			0
78.	<i>Gagea leucantha</i> M. Pop. et Czuga.			+				
79.	<i>Gagea minutissima</i> Vved.				+			
80.	<i>Gagea villosula</i> Vved.				+			2
81.	<i>Gagea holochiton</i> M. Pop. et Czuga.				+			2
82.	<i>Gagea paedophila</i> Vved.				+			
83.	<i>Scilla buharica</i> Dessjat.			+				
84.	<i>Scilla raevskiana</i> Regel				+			2
85.	<i>Fritillaria regelii</i> A. Los.		+				+	
86.	<i>Petilium eduardii</i> (Regel) Vved.			+				3
87.	<i>Tulipa ingens</i> Hoog		+					1
88.	<i>Tulipa greigii</i> Regel		+					2
89.	<i>Tulipa kaufmanniana</i> Regel		+				+	1
90.	<i>Tulipa korshinskyi</i> Vved.				+			
91.	<i>Tulipa korolkovii</i> Regel				+			3
92.	<i>Tulipa lehmanniana</i> Merckl.			+				3
93.	<i>Tulipa bifloriformis</i> Vved.			+				2
94.	<i>Tulipa linifolia</i> Regel				+			2
95.	<i>Tulipa maximowiczii</i> Regel				+		+	2
96.	<i>Tulipa micheliana</i> Hoog			+				3
97.	<i>Tulipa mogoltavica</i> M. Pop. et Vved.		+					3
98.	<i>Tulipa anisophylla</i> Vved.				+			0
99.	<i>Tulipa subquinquefolia</i> Vved.		+					2
100.	<i>Tulipa subpraestans</i> Vved.				+			2
101.	<i>Tulipa praestans</i> Hoog				+			3
102.	<i>Tulipa affinis</i> Z. Botsch.			+				2
103.	<i>Tulipa rosea</i> Vved.				+			2
104.	<i>Tulipa tubergeniana</i> Hoog		+				+	2
105.	<i>Tulipa fosteriana</i> Irv.			+				3
106.	<i>Tulipa lanata</i> Regel		+					2
107.	<i>Eremurus bucharicus</i> Regel					+		
108.	<i>Eremurus hissaricus</i> Vved.					+		
109.	<i>Eremurus saprjagajevii</i> B. Fedtsch.			+				
110.	<i>Eremurus hilariae</i> M. Pop. et Vved.		+					1,2
111.	<i>Eremurus korovinii</i> B. Fedtsch.		+					2
112.	<i>Eremurus brachyspermus</i> Botsch.					+		
113.	<i>Eremurus brachystemon</i> Vved.			+			+	
114.	<i>Eremurus micranthus</i> Vved.				+			0
115.	<i>Eremurus lachnostegius</i> Vved.		+					1
116.	<i>Eremurus pubescens</i> Vved.			+				1,2
117.	<i>Eremurus roseolus</i> Vved.		+				+	2
118.	<i>Eremurus candidus</i> Vved.		+					0,1
119.	<i>Eremurus tadshikorum</i> Vved.				+			2

Table 3 continued

1	2	3	4	5	6	7	8	9
120.	<i>Eremurus mirabilis</i> T. Rajabova				+			
121.	<i>Eremurus aitchisonii</i> Baker			+				3
Alliaceae								
122.	<i>Allium bucharicum</i> Regel			+			+	
123.	<i>Allium collis-magni</i> R. Kam.				+			
124.	<i>Allium gypsodictyum</i> Vved.				+			1
125.	<i>Allium gracillimum</i> Vved.				+			0
126.	<i>Allium sordidiflorum</i> Vved.				+			
127.	<i>Allium darwasicum</i> Regel					+		
128.	<i>Allium flavellum</i> Vved.				+			2
129.	<i>Allium zaprjagajevii</i> Kassacz			+				
130.	<i>Allium ophiophyllum</i> Vved.			+				2
131.	<i>Allium elegans</i> Drob.				+			1
132.	<i>Allium incrustatum</i> Vved.				+			0
133.	<i>Allium glaciale</i> Vved.				+			1
134.	<i>Allium laeniopetalum</i> M. Pop et Vved.				+			1
135.	<i>Allium lipskyanum</i> Vved.				+			2
136.	<i>Allium minutum</i> Vved.				+			0
137.	<i>Allium mogoltavicum</i> Vved.					+		
138.	<i>Allium insufficiens</i> Vved.			+				
139.	<i>Allium confragosum</i> Vved.			+				
140.	<i>Allium hissaricum</i> Vved.		+					
141.	<i>Allium paulii</i> Vved.		+					2
142.	<i>Allium pamiricum</i> Wendelbo				+			
143.	<i>Allium pangasicum</i> Turakulov					+		
144.	<i>Allium rangkulense</i> Ikonn.					+	+	
145.	<i>Allium rosenbachianum</i> Regel				+		+	2
146.	<i>Allium rudolfii</i> Turakulov			+				
147.	<i>Allium sulphureum</i> Vved.			+				
148.	<i>Allium stipitatum</i> Regel			+				2
149.	<i>Allium suworowii</i> Regel			+			+	3
150.	<i>Allium trautvetterianum</i> Regel		+		+			
151.	<i>Allium ferganicum</i> Vved.				+			1
152.	<i>Allium hexaceras</i> Vved.				+			0,1
153.	<i>Allium schugnanicum</i> Vved.				+			0
Amaryllidaceae								
154.	<i>Ungernia victoris</i> Vved.			+				2
155.	<i>Ungernia oligostroma</i> M. Pop. et Vved.				+		+	1
156.	<i>Ungernia tadshikorum</i> Vved.			+				
Iridaceae								
157.	<i>Iris hoogiana</i> Dykes				+			3
158.	<i>Iris darvasica</i> Regel			+			+	3
159.	<i>Iris lineata</i> Foster ex Regel				+			2
160.	<i>Juno baldshuanica</i> (O. et B.Fedtsch.) Vved.					+	+	1
161.	<i>Juno zaprjagajevii</i> N. Abramov					+		
162.	<i>Juno nicolai</i> Vved.				+			3

Table 3 continued

1	2	3	4	5	6	7	8	9
163.	<i>Juno bucharica</i> (Foster) Vved.			+				
164.	<i>Juno rosenbachiana</i> (Regel) Vved.			+				
165.	<i>Juno tadshikorum</i> Vved.				+			0
166.	<i>Juno leptorrhiza</i> Vved.				+			2
167.	<i>Crocus korolkovii</i> Regel et Maw.			+			+	3
Salicaceae								
168.	<i>Populus cataracti</i> Kom.			+			+	0
Betulaceae								
169.	<i>Betula procurva</i> Litv.					+		
170.	<i>Betula tianschanica</i> Rupr.					+		
Juglandaceae								
171.	<i>Juglans regia</i> L.		+					
Ulmaceae								
172.	<i>Celtis caucasica</i> Willd.				+			
Urticaceae								
173.	<i>Urtica dioica</i> L.			+				
174.	<i>Parietaria ruschanica</i> Jarm. ex Ikonn.					+		
Santalaceae								
175.	<i>Thesium gontscharovii</i> Bobr.				+			
176.	<i>Thesium ramosissimum</i> Bobr.				+			
Polygonaceae								
177.	<i>Polygonum baldshuanicum</i> Regel				+			
178.	<i>Polygonum coriarium</i> Grig.			+				
179.	<i>Polygonum ovczinnikovii</i> Czuk.			+				2
180.	<i>Polygonum jaxarticum</i> Sumn.					+		
181.	<i>Polygonum myrtillifolium</i> Kom.				+			
182.	<i>Polygonum schistosum</i> Czuk.				+			
183.	<i>Calligonum griseum</i> Korov. ex Pavl.				+			
184.	<i>Atraphaxis avenia</i> Botsch.				+			1
185.	<i>Atraphaxis karataviensis</i> Lipsch. et Pavl.				+			1
186.	<i>Rheum lucidum</i> Losinsk.				+			
187.	<i>Rheum hissaricum</i> Losinsk.				+			1
188.	<i>Rheum turkestanicum</i> Janisch			+				
189.	<i>Rheum fedtschenkoi</i> Maxim. ex Regel				+			
Chenopodiaceae								
190.	<i>Halocharis gossypina</i> Korov. et Kinzikaeva				+			1
191.	<i>Corispermum hilariae</i> Iljin					+		
192.	<i>Corispermum pamiricum</i> Iljin					+		
193.	<i>Corispermum gelidum</i> Iljin				+			
194.	<i>Halimocnemis lasiantha</i> Iljin			+				
195.	<i>Hammada vakhanica</i> Iljin					+	+	
196.	<i>Seidlitzia rosmarinus</i> Bunge			+			+	3
197.	<i>Atriplex pamirica</i> Iljin				+			
198.	<i>Atriplex schugnanica</i> Iljin				+			
199.	<i>Chenopodium badachschanicum</i> Tzvel.					+		
200.	<i>Chenopodium pamiricum</i> Iljin					+		
201.	<i>Salsola drobovii</i> Botsch.				+			1

Table 3 continued

1	2	3	4	5	6	7	8	9
202.	<i>Salsola pulvinata</i> Botsch.				+			2
203.	<i>Polycnemum perenne</i> Litv.				+			1
Asparagaceae								
204.	<i>Asparagus komarovianus</i> Vved.			+			+	
Caryophyllaceae								
205.	<i>Allochrysa isfarensis</i> Ovcz.					+	+	
206.	<i>Allochrysa tadshikistanica</i> Schischk.				+			2
207.	<i>Stellaria winkleri</i> (Briq.) Schischk.				+			
208.	<i>Stellaria darvasievii</i> R. Kam.				+			
209.	<i>Stellaria schugnanica</i> Schischk.					+		
210.	<i>Gypsophila vedeneevae</i> Lepesch.				+			2
211.	<i>Gypsophila tadshikistanica</i> Botsch.				+		+	2
212.	<i>Bolbosaponaria kafiriganica</i> V. A. Schultz					+		
213.	<i>Bolbosaponaria villosa</i> (Barkoudah) Bondar.			+				
214.	<i>Acanthophyllum brevicalycale</i> Sosk.				+			
215.	<i>Acanthophyllum pulchrum</i> Schischk.				+		+	
216.	<i>Acanthophyllum schugnanicum</i> Schischk.					+	+	
217.	<i>Mesostemma alexeenkoana</i> Ikonn.			+				
218.	<i>Mesostemma schugnanica</i> (Schischk.) Ikonn.					+		
219.	<i>Saponaria babatagi</i> Ovcz.			+				
220.	<i>Silene badachschanica</i> Ovcz.					+		
221.	<i>Silene baranovii</i> Ovcz. et Z. Kurbanbekov			+				
222.	<i>Silene bogdanii</i> Ovcz.				+			
223.	<i>Silene bucharica</i> M. Pop.				+			
224.	<i>Silene vachschii</i> Ovcz.					+		
225.	<i>Silene gasimailikensis</i> B. Fedtsch.					+	+	
226.	<i>Silene megalantha</i> Bondar. et Vved.				+			
227.	<i>Silene apiculata</i> Ovcz.				+			
228.	<i>Silene pamirensis</i> (H. Winkl.) Preobr.					+		
229.	<i>Silene subadenophora</i> Ovcz.				+			2
230.	<i>Silene stenantha</i> Ovcz.				+			
231.	<i>Silene caudata</i> Ovcz.				+			0
232.	<i>Silene lepidifera</i> Ovcz.				+			
233.	<i>Silene schugnanica</i> B. Fedtsch.				+			
234.	<i>Silene hispidula</i> Ovcz.				+			
235.	<i>Eremogone glaucescens</i> (H. Winkl.) Ikonn.			+				
236.	<i>Cerastium alexeenkoanum</i> Schischk.				+			
Ranunculaceae								
237.	<i>Aconitum talassicum</i> M. Pop.			+				3
238.	<i>Anemone bucharica</i> Regel Fin. et Gagnep.			+				1
239.	<i>Anemone eranthoides</i> Regel					+		
240.	<i>Aquilegia darwasi</i> Korsh.				+			1
241.	<i>Aquilegia microphylla</i> (Korsh.) Ikonn.			+				
242.	<i>Delphinium karategini</i> Korsch.					+		
243.	<i>Delphinium lacostei</i> Danguy			+				
244.	<i>Delphinium lipskyi</i> Korsch.				+			

Table 3 continued

1	2	3	4	5	6	7	8	9
245.	<i>Delphinium nevski</i> Zak.				+			0
246.	<i>Delphinium decoloratum</i> Ovcz. et Koczk.				+			2
247.	<i>Delphinium ovczinnikovii</i> Kam. et Pissjauk. ex Kam.			+				2
248.	<i>Delphinium raikovae</i> Pachom.			+				
249.	<i>Atragene sibirica</i> L.		+					1
250.	<i>Clematis boissieriana</i> Ikonn.				+		+	
251.	<i>Clematis orientalis</i> L.			+				
252.	<i>Clematis hilariae</i> Kovalevsk.				+			
253.	<i>Clematis sarezica</i> Ikonn.					+		
254.	<i>Ranunculus baldshuanicus</i> Regel				+			
255.	<i>Ranunculus botschantzevii</i> Ovcz.			+				
256.	<i>Ranunculus alpigenus</i> Kom.				+			
257.	<i>Ranunculus transalaicus</i> Tzvel.			+				
258.	<i>Ranunculus aureopetalus</i> Kom.				+			
259.	<i>Ranunculus krasnovii</i> Ovcz.			+				
260.	<i>Ranunculus pamiri</i> Korsh.					+		
261.	<i>Ranunculus subrigescens</i> Ovcz.			+				
262.	<i>Ranunculus turkestanicus</i> Franch.				+			
263.	<i>Ranunculus chodzhmastonius</i> Ovcz. et Junussov					+		1
264.	<i>Ranunculus jazgulemicus</i> Ovcz.					+		
265.	<i>Pulsatilla kostyczewii</i> (Korsh.) Juz.				+			2
266.	<i>Nigella bucharica</i> Schipcz.			+				
Berberidaceae								
267.	<i>Berberis heterobotrys</i> E. Wolf			+				
268.	<i>Gymnospermium darvasicum</i> (Regel) Takht.			+				2
269.	<i>Leontice ewersmanii</i> Bunge			+				
Papaveraceae								
270.	<i>Glaucium elegans</i> Fisch. et Mey.					+		
Fumariaceae								
271.	<i>Corydalis fimbrillifera</i> Korsh.				+		+	
272.	<i>Corydalis macrocentra</i> Regel			+				
Capparaceae								
273.	<i>Capparis rosanoviana</i> B. Fedtsch.		+					2
274.	<i>Cleome lipskyi</i> M. Pop.					+		1
Cruciferae (Brassicaceae)								
275.	<i>Braya pamirica</i> (Korsh.) O. Fedtsch.				+			
276.	<i>Braya brachycarpa</i> Vass.				+			
277.	<i>Graellsia graellsiiifolia</i> (Lipsky) Poulter				+			
278.	<i>Graellsia transalaica</i> Ikonn.			+				
279.	<i>Graellsia knorringiana</i> (Schischk.) Vved.				+			
280.	<i>Microsymbrium murgabicum</i> Ikonn.				+			
281.	<i>Desideria pamirica</i> Suslova					+		2
282.	<i>Iskandera hissarica</i> N. Busch			+				2
283.	<i>Calymmatium draboides</i> (Korsh.) O. E. Schulz.				+			
284.	<i>Catenularia hedysaroides</i> Botsch.				+			2
285.	<i>Crucianella baldshuanica</i> Krasch.					+		
286.	<i>Draba alticola</i> Kom.				+			

Table 3 continued

1	2	3	4	5	6	7	8	9
287.	<i>Draba darvasica</i> Lipsky					+	+	
288.	<i>Draba kuramensis</i> Junussov					+		
289.	<i>Draba odudiana</i> Lipsky					+		2
290.	<i>Draba pamirica</i> (O. Fedtsch.) Pohle					+		
291.	<i>Draba junussovii</i> Tolm.				+			
292.	<i>Megacarpaea schugnanica</i> B. Fedtsch.					+		2
293.	<i>Pseudoclausia kuramensis</i> Ovcz. et Junussov				+			
294.	<i>Pseudoclausia olgae</i> (Regel et Schmalh.) Botsch.			+				
295.	<i>Neotorularia brachycarpa</i> Ikonn.				+			
296.	<i>Parrya runcinata</i> (Regel et Schmalh.) N. Busch				+			
297.	<i>Parrya schugnana</i> Lipsch.					+		
298.	<i>Capsella bursa-pastoris</i> (L.) Medik.				+			
299.	<i>Prionotrichon pseudoparrya</i> Botsch. et Vved.			+				
300.	<i>Arabis kamelinii</i> Botsch.				+			
301.	<i>Arabidopsis bactriana</i> Ovcz. et Junussov				+			1
302.	<i>Arabidopsis korshinskyi</i> Botsch.			+				
303.	<i>Arabidopsis ovczinnikovii</i> Botsch.				+			
304.	<i>Cardamine seravschanica</i> Botsch.				+			
305.	<i>Sisymbriopsis schugnana</i> Botsch. et Tzvel.					+		
306.	<i>Spryginia pilosa</i> Botsch.					+		2
307.	<i>Spryginia falcata</i> Botsch.				+			
308.	<i>Strigosella tadjikistanica</i> (Vass.) Botsch.				+			
309.	<i>Strigosella leptopoda</i> Bondar. et Botsch.				+			
310.	<i>Strigosella latifolia</i> Bondar. et Botsch.		+					
311.	<i>Stroganovia subalpina</i> (Kom.) Thell.				+			
312.	<i>Stroganovia tolmaczevii</i> Junussov				+			1
313.	<i>Tetracme pamirica</i> Vass.					+		
314.	<i>Phaeonychium abalakovii</i> Junussov					+		1
315.	<i>Phaeonychium surculosum</i> (N. Busch.) Botsch.				+			
316.	<i>Chorispora pamirica</i> Pachom.				+			
317.	<i>Torularia brachycarpa</i> Vass.				+			
318.	<i>Stubendorffia aptera</i> Lipsky				+			
Crassulaceae								
319.	<i>Pseudosedum bucharicum</i> Boriss.				+			
320.	<i>Pseudosedum kamelinii</i> Ikonn.			+				
321.	<i>Pseudosedum kuramense</i> Boriss.			+				
322.	<i>Pseudosedum condensatum</i> Boriss.				+			
323.	<i>Pseudosedum fedtschenkoanum</i> Boriss.			+				
324.	<i>Rhodiola heterodonta</i> (Hook. f. et Thoms.) Boriss.					+		
325.	<i>Rosularia lutea</i> Boriss.				+			2
Saxifragaceae								
326.	<i>Bergenia stracheyi</i> (Hook. f. et Thoms.) Engl.				+			1
327.	<i>Saxifraga pulvinaria</i> H. Smith.				+			1
328.	<i>Saxifraga albertii</i> Regel et Schmalh.				+			1
329.	<i>Ribes malvifolium</i> Pojark.		+				+	1
330.	<i>Ribes janczevskii</i> Pojark.			+				

Table 3 continued

1	2	3	4	5	6	7	8	9
Rosaceae								
331.	<i>Crataegus darvasica</i> Pojark.				+			1
332.	<i>Crataegus pamiroalaica</i> Zapr.			+				1
333.	<i>Crataegus pontica</i> C. Koch.			+				
334.	<i>Cerasus verrucosa</i> (Franch.) Nevski.				+			
335.	<i>Pyrus cajon</i> Zapr.		+					2
336.	<i>Pyrus regelii</i> (Regel et Schmalh.) Rehd.				+			
337.	<i>Pyrus tadshikistanica</i> Zapr.				+			
338.	<i>Fragaria bucharica</i> Losinsk.		+					2
339.	<i>Cotoneaster hissaricus</i> Pojark.				+			
340.	<i>Cotoneaster zeravschanicus</i> Pojark.				+			
341.	<i>Potentilla borissi</i> Ovcz. et Koczk.				+			
342.	<i>Potentilla flabellata</i> Regel et Schmalh.			+				
343.	<i>Potentilla darvasica</i> Juz. ex Botsch.			+				
344.	<i>Potentilla kulabensis</i> Th. Wolf.				+			
345.	<i>Potentilla multifidiformis</i> Ikonn.				+			
346.	<i>Potentilla malacotricha</i> Juz.				+			
347.	<i>Potentilla pamirica</i> Th. Wolf.			+				
348.	<i>Potentilla stanjukoviczii</i> Ovcz. et Koczk.				+			
349.	<i>Potentilla schugnanica</i> Juz. ex Adyl.			+				
350.	<i>Alchemilla hissarica</i> Ovcz. et Koczk.					+		
351.	<i>Alchemilla biradiata</i> Ovcz.				+			
352.	<i>Alchemilla fontinalis</i> Juz.				+			
353.	<i>Alchemilla calviformis</i> Ovcz.				+			
354.	<i>Amygdalus bucharica</i> Korsh.			+				
355.	<i>Amygdalus vavilovii</i> M. Pop.			+				3
356.	<i>Tylosperma lignosa</i> (Willd.) Botsch.				+			2
357.	<i>Padellus mahaleb</i> (L.) Vass.			+				
358.	<i>Pentaphylloides dryadanthoides</i> (Juz.) Sojak			+				
359.	<i>Rosa hissarica</i> Slob.					+		
360.	<i>Rosa longisepala</i> Koczk.				+			2
361.	<i>Rosa korshinskyana</i> Bouleng.				+		+	
362.	<i>Rosa tadzhikistanica</i> Boriss.				+			
363.	<i>Prunus darvasica</i> Temberg			+			+	2
364.	<i>Prunus tadshikistanica</i> Zapr.				+			2
365.	<i>Spiraea baldshuanica</i> B. Fedtsch.					+		
366.	<i>Rosa huntica</i> Chrshan.					+		
367.	<i>Malus sieversii</i> (Ledeb.) Roem.			+				
Leguminosae (Fabaceae)								
368.	<i>Astragalus albertoregelia</i> C. Winkl. et B. Fedtsch.			+				
369.	<i>Astragalus alexeenkoi</i> Gontsch.				+			
370.	<i>Astragalus alitschuri</i> B. Fedtsch.					+		
371.	<i>Astragalus antoniae</i> Grig.				+			
372.	<i>Astragalus badachschanicus</i> Boriss.					+		
373.	<i>Astragalus pauperiformis</i> B. Fedtsch.				+			
374.	<i>Astragalus botschanzevii</i> R. Kam. et Rassul.			+			+	

Table 3 continued

1	2	3	4	5	6	7	8	9
375.	<i>Astragalus vachanicus</i> Boriss. et A. Korol.					+		
376.	<i>Astragalus wachschi</i> B. Fedtsch.					+		
377.	<i>Astragalus cystocarpus</i> Boriss.			+				
378.	<i>Astragalus satteotoichus</i> Gontsch.				+			
379.	<i>Astragalus spongocarpus</i> Meffert				+			
380.	<i>Astragalus darvasicus</i> N. Basil.					+	+	0
381.	<i>Astragalus dsharfi</i> B. Fedtsch.				+	+		
382.	<i>Astragalus djilgensis</i> Franch.				+			
383.	<i>Astragalus dolychopodus</i> Freyn				+			
384.	<i>Astragalus longistipitatus</i> Boriss.			+				
385.	<i>Astragalus ikonnikovii</i> Podlech			+	+			
386.	<i>Astragalus Irinae</i> B. Fedtsch.				+			
387.	<i>Astragalus karategini</i> Gontsch.					+		
388.	<i>Astragalus acanthocarpus</i> Boriss.			+				
389.	<i>Astragalus tecti-mundi</i> Freyn.			+				
390.	<i>Astragalus kurgankolensis</i> Ovcz. et Rassul.					+		
391.	<i>Astragalus linczevskii</i> Gontsch.				+		+	
392.	<i>Astragalus modestii</i> R. Kam.				+			
393.	<i>Astragalus innominatus</i> Boriss.				+			
394.	<i>Astragalus insignis</i> Gontsch.				+			2
395.	<i>Astragalus ovczinnikovii</i> Boriss.			+				
396.	<i>Astragalus oxypterus</i> Boriss.				+			
397.	<i>Astragalus apiculatus</i> Gontsch.			+	+			
398.	<i>Astragalus pamirensis</i> Franch.				+			
399.	<i>Astragalus pischtovensis</i> Gontsch.			+				
400.	<i>Astragalus artemisiiformis</i> Rassul.				+			1
401.	<i>Astragalus subexcedens</i> Gontsch.			+				
402.	<i>Astragalus subspongocarpus</i> Ovcz. et Rassul.				+			1
403.	<i>Astragalus heterotrichus</i> Gontsch.				+			
404.	<i>Astragalus vegetior</i> Gontsch.				+			
405.	<i>Astragalus roschanicus</i> B. Fedtsch.					+		
406.	<i>Astragalus discessiflorus</i> Gontsch.				+			
407.	<i>Astragalus sarygorensis</i> Rassul.			+				
408.	<i>Astragalus surchobi</i> Gontsch.					+		
409.	<i>Astragalus tajjanae</i> Lincz.				+			
410.	<i>Astragalus taschkutanus</i> V. Nikit.				+			2
411.	<i>Astragalus leptophysus</i> Vved.			+				2
412.	<i>Astragalus stenoceroides</i> Boriss.				+			
413.	<i>Astragalus omissus</i> Pachom.			+				
414.	<i>Astragalus chadjanensis</i> Franch.			+				
415.	<i>Astragalus charguschanus</i> Freyn.				+			
416.	<i>Astragalus chingoanus</i> R. Kam.					+		
417.	<i>Astragalus chodshamastonicus</i> Pachom.					+		
418.	<i>Astragalus czapdarinus</i> Ovcz. et Rassul.					+		
419.	<i>Astragalus czilduchtaroni</i> R. Kam.					+		

Table 3 continued

1	2	3	4	5	6	7	8	9
420.	<i>Astragalus scheremetevianus</i> B. Fedtsch.			+				
421.	<i>Astragalus trachycarpus</i> Gontsch.				+			
422.	<i>Astragalus schachdarinus</i> Lipsky					+		
423.	<i>Cercis griffithii</i> Boiss.				+			
424.	<i>Vicia ervilia</i> (L.) Willd					+		
425.	<i>Calophaca sericea</i> B. Fedtsch.				+			2
426.	<i>Melilotus officinalis</i> (L.) Pall.		+					
427.	<i>Keyserlingia mollis</i> (Royle) Boiss.			+				1
428.	<i>Hedysarum baldshuanicum</i> B. Fedtsch.					+		
429.	<i>Hedysarum kamcziraki</i> Karim.				+			
430.	<i>Hedysarum korshinskyanum</i> B. Fedtsch.				+			0
431.	<i>Hedysarum mogianicum</i> B. Fedtsch.				+			2
432.	<i>Hedysarum ovczinnikovii</i> Karim.				+			
433.	<i>Hedysarum hemithamnoides</i> E. Korotk.				+			1
434.	<i>Hedysarum cisdarvasicum</i> R. Kam. et Karim.				+			
435.	<i>Hedysarum tenuifolium</i> (B. Fedtsch.) B. Fedtsch.			+				
436.	<i>Mellissitus badachschanicus</i> (Afan.) Ikonn.					+		
437.	<i>Mellissitus kafiriganicus</i> (Vass.) Latsch.					+		
438.	<i>Mellissitus linczevskii</i> (Vass.) Latsch.				+			
439.	<i>Mellissitus pamiricus</i> (Boriss.) Golosk.				+			
440.	<i>Mellissitus siunicus</i> (Vass.) Latsch.					+		
441.	<i>Merendera hissarica</i> Regel					+		
442.	<i>Cicer baldshuanicum</i> (M. Pop.) Lincz.					+		
443.	<i>Cicer garanicum</i> Boriss.			+				
444.	<i>Cicer korshinskyi</i> Lincz.			+				
445.	<i>Cicer fedchenkoi</i> Lincz.				+		+	
446.	<i>Cicer chorassanicum</i> (Bunge) M.Pop.				+			2
447.	<i>Oxytropis astragaloides</i> Boriss.				+			1
448.	<i>Oxytropis babatagi</i> Abduss.				+			
449.	<i>Oxytropis baissunensis</i> Vass.			+				
450.	<i>Oxytropis baldshuanica</i> B. Fedtsch.					+		
451.	<i>Oxytropis incanescens</i> Freyn.				+			
452.	<i>Oxytropis boguschi</i> B. Fedtsch.				+			
453.	<i>Oxytropis hedinii</i> Ulbrich				+			0
454.	<i>Oxytropis gymnogyne</i> Bunge			+				
455.	<i>Oxytropis gorbunovii</i> Boriss.			+				
456.	<i>Oxytropis guntensis</i> . B. Fedtsch.					+		
457.	<i>Oxytropis aspera</i> Gontsch.			+				
458.	<i>Oxytropis. hirsutiuscula</i> Freyn.			+				
459.	<i>Oxytropis zaprjagaevae</i> Abduss.			+				
460.	<i>Oxytropis zeravschanica</i> Gontsch.				+			
461.	<i>Oxytropis iskanderica</i> B. Fedtsch.				+			
462.	<i>Oxytropis lithophila</i> Vass.				+			
463.	<i>Oxytropis bella</i> B. Fedtsch. ex O. Fedtsch.				+			
464.	<i>Oxytropis rubriargillosa</i> Vass.			+				

Table 3 continued

1	2	3	4	5	6	7	8	9
465.	<i>Oxytropis kuramensis</i> Abduss.					+		1
466.	<i>Oxytropis kuhistanica</i> Abduss.		+					
467.	<i>Oxytropis lehmanii</i> Bunge				+			
468.	<i>Oxytropis linczevskii</i> Gontsch. ex B. Fedtsch. et Vass.				+			
469.	<i>Oxytropis litvinovii</i> B. Fedtsh.					+		
470.	<i>Oxytropis michelsonii</i> B. Fedtsch.			+				
471.	<i>Oxytropis mumynabadensis</i> B. Fedtsch.			+				0
472.	<i>Oxytropis coelestis</i> Abduss.				+			
473.	<i>Oxytropis ovczinnikovii</i> Abduss.				+			
474.	<i>Oxytropis pamiroalaica</i> Abduss.			+				
475.	<i>Oxytropis trichosphaera</i> Freyn				+			
476.	<i>Oxytropis roseiformis</i> B. Fedtsch.				+			
477.	<i>Oxytropis siomensis</i> Abduss.				+			2
478.	<i>Oxytropis crassiuscula</i> Boriss.			+				
479.	<i>Oxytropis leptophysa</i> Bunge				+			
480.	<i>Oxytropis vermicularis</i> Freyn					+		
481.	<i>Colutea hybrida</i> Shap.				+			
482.	<i>Colutea canescens</i> Shap.			+			+	
483.	<i>Thermopsis dolichocarpa</i> V. Nikit.				+			
484.	<i>Tragacantha alekxeenkoana</i> (B. Fedtsch. et Ivanova) Boriss.			+				2
485.	<i>Tragacantha prominens</i> Boriss.				+			
486.	<i>Tragacantha pycnantha</i> Boriss.				+			
487.	<i>Tragacantha dolona</i> Rassul. et B. Scharipova				+			1
488.	<i>Tragacantha transoxana</i> (Fisch.) Kuntze				+			
489.	<i>Tragacantha hilariae</i> Boriss.				+			
490.	<i>Tragacantha rubens</i> (B. Fedtsch. et Ivanova) Boriss.				+			
491.	<i>Tragacantha macrantha</i> Boriss.				+			
492.	<i>Tragacantha kuramensis</i> Boriss.				+			
493.	<i>Tragacantha devia</i> Boriss.				+			
494.	<i>Tragacantha tenuispina</i> Boriss.				+			
495.	<i>Caragana turkestanica</i> Kom.				+			
496.	<i>Chesnea badachschanica</i> Boriss.					+		
497.	<i>Chesneya hissarica</i> Boriss.					+		
498.	<i>Chesneya darvasica</i> Boriss.				+			
499.	<i>Chesneya linczevskiyi</i> Boriss.				+			
500.	<i>Chesneya neplii</i> Boriss.				+			1
501.	<i>Chesneya tadjikistana</i> Boriss.				+			2
502.	<i>Chesneya crassipes</i> Boriss.			+				
503.	<i>Chesniella gracilis</i> Boriss.			+				
504.	<i>Lens orientalis</i> Schmalh.			+				
505.	<i>Lathyrus mulkak</i> Lipsky			+				
506.	<i>Ewersmannia sogdiana</i> Ovcz.				+		+	1
507.	<i>Onobrychis baldshuanica</i> Sirjaev					+	+	
508.	<i>Onobrychis gontscharovii</i> Vass.				+			2
509.	<i>Onobrychis darwasica</i> Vass.					+		
510.	<i>Onobrychis seravschanica</i> B. Fedtsch.				+			

Table 3 continued

1	2	3	4	5	6	7	8	9
Geraniaceae								
511.	<i>Geranium wakhanicum</i> (Pauls.) Ikonn.					+	+	
512.	<i>Geranium minutum</i> Ikonn.				+			
513.	<i>Geranium pamiricum</i> Ikonn.					+		
514.	<i>Geranium collinum</i> Steph. ex Willd.		+					
Linaceae								
515.	<i>Linum macrorhizum</i> Juz.				+			
516.	<i>Linum olgae</i> Vved.				+			
Zygophyllaceae								
517.	<i>Malacocarpus crithmifolius</i> (Retz.) C. A. Mey.			+				2
518.	<i>Zygophyllum bucharicum</i> B. Fedtsch.			+			+	1
519.	<i>Zygophyllum darvasicum</i> Boriss.				+			2
520.	<i>Zygophyllum macrophyllum</i> Regel et Schmalh.				+			1
Nitrariaceae								
521.	<i>Nitraria pamarica</i> (L.) Vassil.				+			
Rutaceae								
522.	<i>Haplophyllum tenuisectum</i> Lincz. et Vved.				+			
Ebenaceae								
523.	<i>Diospyros lotus</i> L.		+				+	3
Euphorbiaceae								
524.	<i>Andrachne pusilla</i> Pojark.				+			0
525.	<i>Euphorbia poecilophylla</i> Prokh.			+				
526.	<i>Tithumalus guntensis</i> Ikonn.					+		
527.	<i>Tithumalus roschanicus</i> Ikonn.					+		
528.	<i>Tithumalus schugnanicus</i> Ikonn.					+		
Anacardiaceae								
529.	<i>Rhus coriara</i> L.			+				
530.	<i>Pistacia vera</i> L.			+				
Rhamnaceae								
531.	<i>Rubia schugnanica</i> B. Fedtsch. ex Pojark.					+		
532.	<i>Sedum bucharicum</i> Boriss.				+			
533.	<i>Rochelia claviculata</i> M. Pop. et Zak.				+			
Malvaceae								
534.	<i>Malva neglecta</i>			+				
Tamaricaceae								
535.	<i>Myrtama elegans</i> (Royle) Ovcz. et Kinz.				+			2
Violaceae								
536.	<i>Viola alexejana</i> R. Rfv. et Junuss.				+			
537.	<i>Viola majchurensis</i> Pissjauk.			+				
538.	<i>Viola fedtschenkoana</i> W. Beck.				+		+	
Elaeagnaceae								
539.	<i>Elaeagnus songarica</i> (Bernh. ex Schlecht.)				+			
540.	<i>Elaeagnus angustifolia</i> L.			+				
541.	<i>Hippophaë rhamnoides</i> L.			+				

Table 3 continued

1	2	3	4	5	6	7	8	9
Punicaceae								
542.	<i>Punica granatum</i> L.		+					2
Onagraceae								
543.	<i>Epilobium korshinskyi</i> Morov.			+				
544.	<i>Epilobium thermophilum</i> Pauls.			+				
Umbelliferae (Apiaceae)								
545.	<i>Aulacospermum badachschanicum</i> Ikonn.				+			
546.	<i>Bunium persicum</i> (Boriss.) B. Fedtsch.				+		+	3
547.	<i>Galagania fragrantissima</i> Lypsky				+			
548.	<i>Coniocelinum schugnanicum</i> B. Fedtsch.					+		
549.	<i>Cephalopodium badachschanicum</i> Korov.				+			2
550.	<i>Peucedanum hissaricum</i> Korov.				+			2
551.	<i>Seseli sclerophyllum</i> Korov.				+			1
552.	<i>Seseli seravschanicum</i> M. Pimen. et Sdobn.					+		
553.	<i>Seseli karateginum</i> Lipsky					+		
554.	<i>Seseli rimosum</i> M. Pimen.			+				
555.	<i>Zeravschania scabrifolia</i> M. Pimen.				+			
556.	<i>Zeravschania regeliana</i> Korov.		+				+	2
557.	<i>Kafirnigania hissarica</i> (Korov.) R. Kam. et Kinz.					+		
558.	<i>Cnidocarpa alaica</i> M. Pimen.				+			
559.	<i>Korshinskya bupleuroides</i> Korov.			+				1
560.	<i>Mogoltavia sewertzowii</i> (Regel) Korov.			+				2
561.	<i>Daucus carota</i> L.			+				
562.	<i>Neopaulia alpina</i> (Schischk.) M. Pimen. et Kljuykov				+			
563.	<i>Parasilaus asiaticus</i> (Korov.) M. Pimen.			+				1
564.	<i>Semenovia furcata</i> Korov.				+			
565.	<i>Semenovia zaprjagaevii</i> Korov.				+			
566.	<i>Semenovia pamirica</i> (Lipsky) Manden.				+			
567.	<i>Ferulla botschantzevii</i> Korov.				+			
568.	<i>Ferula eugenii</i> R. Kam.			+				2
569.	<i>Ferula lithophila</i> M. Pimen			+				1
570.	<i>Ferula karategina</i> Lipsky ex Korov.			+				
571.	<i>Ferula koso-poljanskyi</i> Korov.			+				
572.	<i>Ferula kokanica</i> Regel et Sckmalh.			+				
573.	<i>Ferula linczewskii</i> Korov.				+			
574.	<i>Ferula mogoltavica</i> Lipsky ex Korov.				+			1
575.	<i>Ferula decurrens</i> Korov.				+		+	
576.	<i>Ferula sumbul</i> (Kauffm.) Hook. F.			+			+	3
577.	<i>Ferula violacea</i> Korov.			+				
578.	<i>Ferula latiloba</i> Korov.				+			2
Primulaceae								
579.	<i>Dionysia involucreta</i> Zapr.			+			+	2
580.	<i>Dionysia gandzhinae</i> R. Kam.			+			+	
581.	<i>Primula flexuosa</i> Turkev.			+				1
582.	<i>Primula lactiflora</i> Turkev.				+			2

Table 3 continued

1	2	3	4	5	6	7	8	9
583.	<i>Androsace alaica</i> Ovcz. et Astan.				+			
584.	<i>Androsace pavlovskiyi</i> Ovcz.			+				
Limoniaceae								
585.	<i>Acantholimon komarovii</i> Czerniak. ex Lincz.				+			1
586.	<i>Acantholimon alexeenkoanum</i> Czerniak. et Ikonn.			+	+	+		
587.	<i>Acantholimon anzobicum</i> Lincz.					+		
588.	<i>Acantholimon afanassievii</i> Lincz.				+			
589.	<i>Acantholimon velutinum</i> Czerniak. et Lincz.				+			
590.	<i>Acantholimon varitzevae</i> Czerniak.				+			1
591.	<i>Acantholimon zaprjagaevii</i> Lincz.				+			1
592.	<i>Acantholimon hilariae</i> Ikonn.			+				
593.	<i>Acantholimon kuramense</i> Lincz.					+		
594.	<i>Acantholimon parviflorum</i> Regel			+				
595.	<i>Acantholimon pamiricum</i> Czerniak. ex Lincz.				+			
596.	<i>Acantholimon pseudolycopodioides</i> Ikonn.			+				
597.	<i>Acantholimon raikoviae</i> Czerniak.			+				
598.	<i>Vassilczenkoa sogdiana</i> (Lincz.) Lincz.				+			3
599.	<i>Limonium komarovii</i> Jk.-Jal.				+			
600.	<i>Limonium ovczinnikovii</i> Lincz. et Czuk.				+			
601.	<i>Cephalorhizum popovii</i> Lincz.			+				
602.	<i>Neogontscharovia mira</i> (Lincz.) Lincz.				+			2
603.	<i>Eremolimon kurgantjubense</i> Lincz.					+	+	
604.	<i>Eremolimon fajzievii</i> (Zak. ex Lincz.) Lincz.				+			
Paeoniaceae								
605.	<i>Paeonia intermedia</i> C. A. Mey.			+			+	3
Moraceae								
606.	<i>Ficus afghanistanica</i> Warb.			+				3
607.	<i>Ficus carica</i> L.		+					3
Oleaceae								
608.	<i>Jasminum revolutum</i> Sims.		+					1
609.	<i>Zeuxine strateumatica</i> (L.) Schlechter				+			1
610.	<i>Eulophia turkestanica</i> (Litv.) Schlechter		+					1-2
Cornaceae								
611.	<i>Thelycrania darvasica</i> Pojark.					+	+	1
Gentianaceae								
612.	<i>Gentianella pamirica</i> (Grossh.) Holub.					+		
613.	<i>Swertia fedtschenkoana</i> Pissjauk.				+			
614.	<i>Swertia schugnanica</i> Pissjauk.				+			
Convolvulaceae								
615.	<i>Convolvulus tujuntauensis</i> Kinz.					+		
Cuscutaceae								
616.	<i>Cuscuta callinema</i> Butk.				+			
617.	<i>Cuscuta pamirica</i> Butk.					+		
618.	<i>Cuscuta ruschanica</i> Junuss.				+			

Table 3 continued

1	2	3	4	5	6	7	8	9
Boraginaceae								
619.	<i>Hackelia murgabica</i> Czuk.					+		
620.	<i>Hackelia popovii</i> Czuk.				+			
621.	<i>Heliotropium pileiforme</i> Czuk.					+		
622.	<i>Matthiola bucharica</i> Czerniak.				+			
623.	<i>Lepechiniella minuta</i> (Lipsky) M. Pop.				+			
624.	<i>Lappula badachshanica</i> M. Pop. ex Ikonn.					+		
625.	<i>Lappula paulsenii</i> (Brand) M. Pop.			+				
626.	<i>Lappula rupicola</i> Zak.			+				
627.	<i>Macrotomia cana</i> Tzvel.				+			
628.	<i>Eritrichium pamiricum</i> B. Fedtsch.				+			
629.	<i>Eritrichium subjacquemontii</i> M. Pop.				+			
630.	<i>Eritrichium pseudostrictum</i> M.Pop.			+				
631.	<i>Eritrichium dubium</i> O. Fedtsch.				+			
632.	<i>Nonea macropoda</i> M. Pop.				+			
633.	<i>Pseudomertensia rosulata</i> Ovcz. et Czuk.				+			
634.	<i>Rindera korshinskyi</i> (Lipsky) Brand				+			
635.	<i>Solenanthes albiflorus</i> Czuk. et Meling				+			
636.	<i>Solenanthes plantaginifolius</i> Lipsky				+			
Verbenaceae								
637.	<i>Vitex agnus-castus</i> L.				+			2
Lamiaceae (Labiatae)								
638.	<i>Origanum tyttanthum</i> Gontsch.			+				
639.	<i>Lagochilus kschtutensis</i> Knorr.				+			
640.	<i>Lagochilus schugnanicus</i> Knorr.					+	+	
641.	<i>Ziziphora pamiroalaica</i> Juz.			+				
642.	<i>Dracocephalum formosum</i> Gontsch.		+					1
643.	<i>Dracocephalum schischkinii</i> Strizhova				+			
644.	<i>Phlomis cyclodon</i> Knorr.				+			
645.	<i>Nepeta badachschanica</i> Kudr.				+		+	
646.	<i>Nepeta gontscharovii</i> Kudr.				+			
647.	<i>Nepeta ladanolens</i> Lipsky			+				
648.	<i>Nepeta maussarifi</i> Lipsky				+			
649.	<i>Nepeta tyttantha</i> Pojark.				+			
650.	<i>Nepeta odorifera</i> Lipsky				+			
651.	<i>Nepeta consanguinea</i> Pojark.					+		
652.	<i>Nepeta schugnanica</i> Lipsky					+		
653.	<i>Kudrjaschevia grubovii</i> Kocz. k.				+			
654.	<i>Kudrjaschevia korshinkyi</i> (Lipsky) Pojark.			+			+	2
655.	<i>Kudrjaschevia nadiniae</i> (Lipsky) Pojark.			+				2
656.	<i>Kudrjaschevia pojarkoviae</i> Ikonn.			+				
657.	<i>Kudrjaschevia allotricha</i> Pojark.				+			
658.	<i>Lophanthus varzobicus</i> Kocz. k.				+			
659.	<i>Mellissa officinalis</i> L.			+				
660.	<i>Mentha asiatica</i> Boriss.			+				
661.	<i>Perovskia virgata</i> Kudr.			+				
662.	<i>Eremostachys albertii</i> Regel			+				
663.	<i>Eremostachys baldshuanica</i> Regel				+			

Table 3 continued

1	2	3	4	5	6	7	8	9
664.	<i>Eremostachys botschantzevii</i> Adylov				+			
665.	<i>Eremostachys serawschanica</i> Regel					+		
666.	<i>Eremostachys korshinskyi</i> Ikonn.				+			
667.	<i>Eremostachys mogianica</i> M. Pop.					+		
668.	<i>Eremostachys popovii</i> Gohntschi				+			
669.	<i>Eremostachys sanglechensis</i> Ikonn.				+			
670.	<i>Eremostachys schugnanica</i> (M. Pop) Knorr					+	+	
671.	<i>Thymus diminutus</i> Klok.			+				
672.	<i>Salvia baldshuanica</i> Lipsky			+				1
673.	<i>Salvia glabricaulis</i> Pobed.					+		1
674.	<i>Salvia gontscharovii</i> Kudr.				+			1
675.	<i>Salvia insignis</i> Kudr.			+				3
676.	<i>Salvia kamelinii</i> Machmedov				+			
677.	<i>Salvia komarovii</i> Pobed.			+				
678.	<i>Salvia campylodonta</i> Botsch.					+		
679.	<i>Scutellaria velutina</i> Juz. et Vved.			+				
680.	<i>Scutellaria gontscharovii</i> Juz.					+		
681.	<i>Scutellaria zaprjagaevii</i> Koczki. et Zhogoleva				+			
682.	<i>Scutellaria rubromaculata</i> Juz. et Vved.			+				
683.	<i>Scutellaria orbicularis</i> Bunge				+			
684.	<i>Scutellaria megalodonta</i> Juz.				+			
685.	<i>Scutellaria polytricha</i> Juz. et Vved.				+			
686.	<i>Scutellaria haesitabunda</i> Juz.				+			
687.	<i>Scutellaria phyllostachya</i> Juz.				+			
688.	<i>Scutellaria pamirica</i> Juz.					+		
689.	<i>Scutellaria poëcilantha</i> Nevski. ex Juz.			+				
690.	<i>Scutellaria picta</i> Juz.				+			
691.	<i>Scutellaria chodshakasiani</i> R. Kam.				+			
692.	<i>Scutellaria schugnanica</i> B. Fedtsch.					+		
693.	<i>Scutellaria juzepeczukii</i> Gontsch.			+				
694.	<i>Erianthera rhomboidea</i> Benth.				+			1
Scrophulariaceae								
695.	<i>Veronica ramosissima</i> Boriss.				+			
696.	<i>Linaria alaica</i> Junuss.			+				
697.	<i>Linaria badachschanica</i> Junuss.					+		
698.	<i>Linaria quasisessilis</i> Ikonn.			+		+		
699.	<i>Pedicularis grigorjevii</i> Ivanina				+			
700.	<i>Pedicularis pulchra</i> Pauls.				+			
701.	<i>Pedicularis amoeniflora</i> Vved.				+			
702.	<i>Scrophularia kabadianensis</i> B. Fedtsch.				+			
703.	<i>Scrophularia verticillata</i> Gontsch. et Grig.				+			
704.	<i>Scrophularia pamirica</i> (O. Fedtsch.) Ivanina					+		
705.	<i>Scrophularia glabella</i> Botsch. et Junuss.				+			
706.	<i>Scrophularia fedtschenkoi</i> Gorschk.			+				
707.	<i>Euphrasia tranzschelii</i> Juz.			+				

Table 3 continued

1	2	3	4	5	6	7	8	9
708.	<i>Euphrasia fedchenkoana</i> Wettst. ex Juz.				+			
709.	<i>Euphrasia schugnanica</i> Juz.					+		
Rubiaceae								
710.	<i>Neogaillonia asperuliformis</i> (Lincz.) Lincz.			+				
711.	<i>Asperula badachschanica</i> Ikonn.					+		
712.	<i>Asperula gypsacea</i> Pachom.			+				
713.	<i>Asperula karategini</i> Pachom. et Karim.					+		
714.	<i>Asperula pugionifolia</i> Tschern.				+			
715.	<i>Asperula insolita</i> Pachom.			+				
716.	<i>Asperula pamirica</i> Pobed.					+		
717.	<i>Asperula strizhoviaae</i> Pachom. et Karim.				+			
718.	<i>Asperula fedchenkoi</i> Ovcz. et Tschern.				+			
719.	<i>Asperula czukaviniae</i> Pachom. et Karim.				+			
Caprifoliaceae								
720.	<i>Lonicera pamirica</i> Pojark.				+			
721.	<i>Lonicera heterotracha</i> Pojark. et Zak.					+	+	2
722.	<i>Lonicera paradoxa</i> Pojark.			+				2
Valerianaceae								
723.	<i>Valerianella anodon</i> Lincz.				+			2
724.	<i>Valeriana albiflora</i> (B. Scharipova) B. Scharipova				+			
725.	<i>Valerianella kulabensis</i> Lipsky. ex Lincz.				+			2
Cucurbitaceae								
726.	<i>Melo agrestis</i> (Naud.) Pang.				+			
727.	<i>Bryonia lappifolia</i> Vass.			+				2
Campanulaceae								
728.	<i>Campanula hissarica</i> R. Kam			+				
729.	<i>Cryptocodon monocephalus</i> (Trautv) Fed.			+				2
730.	<i>Ostrowskia magnifica</i> Regel				+		+	3
Compositae (Asteraceae)								
731.	<i>Asyneuma baldshuanicum</i> (O. Fedtsch.) Fed.					+		
732.	<i>Anaphalis garanica</i> Boriss.			+				
733.	<i>Anaphalis scopulosa</i> Boriss.				+			
734.	<i>Anaphalis subtilis</i> Kinz. et Vainberg			+				
735.	<i>Anaphalis tenuicaulis</i> Boriss.				+			
736.	<i>Anaphalis latifolia</i> Kinz. et Vainberg				+			
737.	<i>Cirsium badachschanicum</i> Charadze					+		
738.	<i>Ligularia alpigena</i> Pojark.					+		
739.	<i>Ligularia altissima</i> Pojark.				+			
740.	<i>Ligularia thomsonii</i> Pojark.				+			
741.	<i>Halothamnus seravschanicus</i> Botsch.					+		
742.	<i>Hyalearia tadshicorum</i> (Tzvel) Sojak				+			
743.	<i>Saussurea bucharica</i> (B. Fedtsch.) Preobr.					+	+	
744.	<i>Saussurea caprifolia</i> Iljin et Zapr.				+			1
745.	<i>Saussurea kabadiana</i> Rassul. et Scharipova					+		
746.	<i>Saussurea masarica</i> Lipsky				+			
747.	<i>Saussurea tadshicorum</i> Iljin et Gontsch.				+			1
748.	<i>Saussurea carducephala</i> (Iljin) Iljin				+			

Table 3 continued

1	2	3	4	5	6	7	8	9
749.	<i>Inula baldshuanica</i> (O.et B. Fedtsch.) Vved.					+		
750.	<i>Inula macrophylla</i> Kar. et Kir.			+				
751.	<i>Inula glauca</i> C. Winkl				+			
752.	<i>Inula schischkinii</i> Gorschk.					+		
753.	<i>Inula schmalhauseni</i> C. Winkl.				+			
754.	<i>Hippolytia schugnanica</i> (C.Winkl.) Pojark.				+			
755.	<i>Lepidium seravschanicum</i> Ovcz. et Junuss.					+		
756.	<i>Scorzonera albertoregelia</i> C. Winkl.			+				
757.	<i>Scorzonera gracilis</i> Lipsch.			+				
758.	<i>Scorzonera tadshikorom</i> Krasch. et Lipsch.				+			
759.	<i>Scorzonera tau-saghyz</i> Lipsch. et Bosse			+				
760.	<i>Tragopogon pamiricum</i> Ikonn.				+			
761.	<i>Cousinia albertoregelia</i> C. Winkl.				+			
762.	<i>Cousinia alpina</i> Bunge			+				
763.	<i>Cousinia batalinii</i> C. Winkl.				+			
764.	<i>Cousinia splendida</i> C. Winkl.				+			
765.	<i>Cousinia acrodroma</i> Tschern.			+				
766.	<i>Cousinia magnifica</i> Juz.				+			
767.	<i>Cousinia ramulosa</i> Rich.				+			
768.	<i>Cousinia tomentella</i> C. Winkl.				+			
769.	<i>Cousinia princeps</i> Franch.				+			
770.	<i>Cousinia agelocephala</i> Tschern.				+			1
771.	<i>Cousinia coerulea</i> Kult. et Tschren.				+			
772.	<i>Cousinia grigorievii</i> Juz.			+				
773.	<i>Cousinia darwasica</i> C.Winkl.					+		2
774.	<i>Cousinia rava</i> C. Winkl.			+				
775.	<i>Cousinia serawschanica</i> C. Winkl.					+		
776.	<i>Cousinia hilariae</i> Kult.				+			1
777.	<i>Cousinia necopinata</i> Pojark.				+		+	
778.	<i>Cousinia rubiginosa</i> Kult.				+			
779.	<i>Cousinia ulotoma</i> Bornm.				+			
780.	<i>Cousinia calva</i> Juz.					+		
781.	<i>Cousinia egens</i> Juz.				+			
782.	<i>Cousinia ovzinnikovii</i> Tschern.			+				
783.	<i>Cousinia finitima</i> Juz.					+		
784.	<i>Cousinia semidecurrans</i> C. Winkl.			+				
785.	<i>Cousinia ferruginea</i> Kult.				+			
786.	<i>Cousinia ceratophora</i> Kult.				+			
787.	<i>Cousinia sororia</i> Juz.					+		
788.	<i>Cousinia sclerophylla</i> Juz.			+				
789.	<i>Cousinia leptocampyla</i> Bornm.				+			2
790.	<i>Cousinia stephanophora</i> C. Winkl.				+			
791.	<i>Cousinia abbreviata</i> Tschern.				+			
792.	<i>Cousinia fedtschenkoana</i> Bornm.			+			+	
793.	<i>Cousinia franchetii</i> C. Winkl.					+		

Table 3 continued

1	2	3	4	5	6	7	8	9
794.	<i>Cousinia peduncularis</i> Juz. ex Tscherneva			+				
795.	<i>Cousinia trachyphylla</i> Juz.			+				
796.	<i>Cousinia schugnanica</i> Juz.					+		
797.	<i>Cousinia corymbosa</i> C. Winkl.				+			1
798.	<i>Cousinia oopoda</i> Juz.					+		
799.	<i>Erigeron badachschanicus</i> Botsch.					+		2
800.	<i>Modestia darwasica</i> (C. Winkl) Charadze et Tamamsch.					+		
801.	<i>Modestia mira</i> (Iljin) Charadze			+				
802.	<i>Echinops wachanicus</i> Rech.				+			
803.	<i>Echinops hissaricus</i> Rassul. et B.Scharipova.					+		
804.	<i>Echinops abstersibilis</i> Iljin				+			
805.	<i>Echinops karatavicus</i> Regel et Schmalh.				+			
806.	<i>Jurinea darvasica</i> Iljin					+		2
807.	<i>Jurinea kuraminensis</i> Iljin				+			
808.	<i>Jurinea pteroclada</i> Iljin				+			1
809.	<i>Jurinea impressinervis</i> Iljin				+			1
810.	<i>Jurinea propinqua</i> Iljin				+			
811.	<i>Jurinea tadshikistanica</i> Iljin				+			1
812.	<i>Taraxacum badachschanicum</i> Schischk.					+		2
813.	<i>Taraxacum varsobicum</i> Schischk.				+			
814.	<i>Taraxacum guntense</i> Dengubenko.					+		
815.	<i>Taraxacum ikonnikovii</i> Schischk.				+		+	
816.	<i>Taraxacum kovalevskiae</i> Vainberg			+				
817.	<i>Taraxacum rubidium</i> Schischk.			+				
818.	<i>Taraxacum murgabicum</i> Vainberg.				+			
819.	<i>Taraxacum nikolayi</i> Vainberg.			+				
820.	<i>Taraxacum pamiricum</i> Schischk.				+			
821.	<i>Taraxacum pojarkoviae</i> Schischk.			+				
822.	<i>Taraxacum raikoviae</i> Vainberg			+				
823.	<i>Taraxacum stanjukoviczii</i> Schischk.				+			
824.	<i>Taraxacum srtizhoviaae</i> Vainberg			+				
825.	<i>Taraxacum tzvelevii</i> Schischk.			+				
826.	<i>Taraxacum schugnanicum</i> Schischk.					+		1
827.	<i>Taraxacum jaschilkuliense</i> Vainberg				+		+	
828.	<i>Olgaea baldshuanica</i> (C. Winkl.) Iljin					+		
829.	<i>Onopordum seravschanicum</i> Tamamsch.			+				
830.	<i>Onopordum prjachinii</i> Tamasmch.				+			
831.	<i>Pentanema varzobicum</i> R. Kam. et Kinz.					+		
832.	<i>Pentanema glanduligerum</i> (Krasch.) Gonschck.				+			
833.	<i>Pyretrum mikeschinii</i> Tzvel.		+				+	1
834.	<i>Polytaxis winkleri</i> Iljin			+				
835.	<i>Artemisia leucotricha</i> Krasch. ex Ladyg.			+				
836.	<i>Artemisia vachanica</i> Krasch.					+		
837.	<i>Artemisia korshinskyi</i> Krasch.			+				
838.	<i>Artemisia kuschakewiczii</i> C. Winkl.				+			
839.	<i>Artemisia skorniakovii</i> C. Winkl.			+				

Table 3 continued

1	2	3	4	5	6	7	8	9
840.	<i>Artemisia cina</i> Berg ex Pojark. var. <i>Mogoltavica</i>		+				+	3
841.	<i>Artemisia czukavinae</i> Filat.					+	+	
842.	<i>Psychogeton biramosus</i> (Botsch.) Grierson				+			
843.	<i>Pyrethrum hissaricum</i> Krasch.					+		
844.	<i>Serratula chartacea</i> C. Winkl.			+				
845.	<i>Scariola albertoregelia</i> (C. Winkl.) Kirp.			+				
846.	<i>Tanacetopsis czukavinae</i> Junuss. et Kovalevsk.				+			
FAUNA								
MANTOPTERA								
1.	<i>Hierodula tenuidentata</i> Saussure							1
2.	<i>Rivetina crassa</i> Mistshenko							1
3.	<i>Rivetina beybienkoi</i> Lindt							1
4.	<i>Rivetina monticola</i> Mistshenko							1
5.	<i>Amblythespis mistshenkoi</i> Lindt							1
6.	<i>Mantis macrocephala</i> Lindt							1
7.	<i>Empusa pennicornis</i> Pallas							1
HOMOPTERA								
8.	<i>Porphyrophora cynodontis</i> Arch.		+					2
9.	<i>Porphyrophora odorata</i> Arch.							2
10.	<i>Porphyrophora sophorae</i> Arch.			+				2
HETEROPTERA								
11.	<i>Dalpada pavlovskii</i> Kir.							2
12.	<i>Mustha baranovi</i> Kir.			+				2
13.	<i>Cellobius abdominalis</i> Jak.							2
14.	<i>Calisius turanicus</i> Kir.							
15.	<i>Stenolemus bogdanovi</i> Osh.							1
16.	<i>Reduvius fedtschenkianus</i> Osh.							2
COLEOPTERA								
17.	<i>Carabus tadjikistanus</i> Kryzh.							2
18.	<i>Carabus sphinx</i> Reitt.							2
19.	<i>Carabus hissarianus</i> Sem.				+			2
20.	<i>Carabus klapperichianus</i> Mandl							2
21.	<i>Carabus arcanus</i> Sem.							1
LEPIDOPTERA								
22.	<i>Papilio alexanor</i> Esp.						+	1
23.	<i>Anthocharis tomyris</i> Chr.		+					2
24.	<i>Colias sieversi</i> Gr.-Gr.		+					1
25.	<i>Melitaea acreina</i> Stgr.							1
26.	<i>Polyommatus (Lysandra) avinovi</i> Ju. Ju. Stshetkin				+			1
27.	<i>Polyommatus (Eumedonia) kogistana</i> Gr.-Gr.				+		+	2
28.	<i>Dolbinopsis grisea</i> Hamps.							2
29.	<i>Amorpha philerema</i> Djak.						+	1
30.	<i>Acosmeryx naga hissarica</i> Stshetkin					+		2
31.	<i>Celerio chamyla apocyni</i> Stshetkin							2
32.	<i>Paragluphisia oxiana</i> Djak.			+				1
33.	<i>Taragama fainae</i> Geras.			+				1
34.	<i>Lemonia tancrei</i> Punglr.		+					1

Table 3 continued

1	2	3	4	5	6	7	8	9
35.	<i>Nola silvicola</i> Stshetkin					+		1
36.	<i>Nola elaeagni</i> Stshetkin				+			1
37.	<i>Pseudohadena seposita</i> Pungl.			+				1
38.	<i>Catocala optima</i> Stgr.							1
39.	<i>Catocala timur</i> A.B.-H.							1
40.	<i>Lygephila lubrosa</i> Stgr.			+				1
41.	<i>Eupithecia djakonovi</i> Stshetkin				+			2
42.	<i>Eupithecia dominaria</i> Stshetkin					+		2
HYMENOPTERA								
43.	<i>Prosopigastra gigantea</i> Guss.							2
44.	<i>Tachysphex radiatus</i> Guss.							2
45.	<i>Barylypa ammabilis</i> Tas.							2
46.	<i>Ichneumon sarcitorius</i> L.							2
47.	<i>Diadegma velox</i> Holmg.							2
48.	<i>Phobocampe bicingulata</i> Grov.							2
49.	<i>Netelia juscicornis</i> Holmg.							2
50.	<i>Ichneumon albiger</i> Wesm.							2
MOLLUSCA								
51.	<i>Pupilla anzobica</i> Izzat.							2
52.	<i>Pupoides coenopictus</i> Hutton							2
53.	<i>Planogyra sororcula</i> Benoit							2
54.	<i>Leucozonella caria</i> Schileyko				+			1
55.	<i>Pseudamnicola likharevi</i> Izzat.				+			2
56.	<i>Pseudamnicola pavlovskii</i> Izzat.				+			2
57.	<i>Melanooides shahdaraensis</i> Starob.et Izzat.					+		2
58.	<i>Anodonta bactriana</i> Rolle.							1
PISCES								
59.	<i>Pseudoscaphirhynchus kaufmannii</i> Bogdanow			+			+	2
60.	<i>Pseudoscaphirhynchus fedtschenkoi</i> Kessler			+				1
61.	<i>Aspiolucius esocinus</i> Kessler			+				2
62.	<i>Barbus brachycephalus</i> Kessler			+				2
REPTILIA								
63.	<i>Crossobamon eversmanni</i> Weigmann			+				1
64.	<i>Teratoscincus scincus rustamowi</i> Szczerbak.			+			+	2
65.	<i>Gymnodactylus caspius</i> Eichwald			+				2
66.	<i>Alsophylax loricatus loricatus</i> Strauch			+				2
67.	<i>Phrynocephalus helioscopus said-alievi</i> Szczerbak et Satt.			+				2
68.	<i>Phrynocephalus sogdianus</i> Cern.			+				1
69.	<i>Phrynocephalus mystaceus</i> Pallas			+				1
70.	<i>Varanus griseus</i> Daudin		+				+	1
71.	<i>Eremias scripta pherganensis</i> Szczerbak et Washenko				+			2
72.	<i>Eremias scripta</i> Str.			+				1
73.	<i>Eremias grammica</i> Licht.			+				2
74.	<i>Ablepharus deserti</i> Strauch			+				2
75.	<i>Ablepharus alaicus</i> Elpatjewsky			+				2
76.	<i>Eumeces schneideri</i> Daudin		+					2
77.	<i>Typhlops vermicularis</i> Merrem			+			+	2

Table 3 continued

1	2	3	4	5	6	7	8	9
78.	<i>Eryx tataricus</i> Lichtenstein			+			+	2
79.	<i>Lycodon striatus bicolor</i> Nicolsky			+				2
80.	<i>Boiga trigonatum melanocephala</i> Annandale			+				2
81.	<i>Naja oxiana</i> Eichward		+				+	2
82.	<i>Vipera lebetina turanica</i> Cernow		+					2
83.	<i>Echis carinatus</i> Schneider			+			+	1
AVES								
84.	<i>Ciconia ciconia asiatica</i> Severtzov			+			+	1
85.	<i>Ciconia nigra</i> L.			+			+	1
86.	<i>Anser indicus</i> Lath.		+				+	1
87.	<i>Gyps himalayensis</i> Hume			+			+	2
88.	<i>Gypaetus barbatus hemachalanus</i> Hutt			+			+	2
89.	<i>Circaetus ferox heptneri</i> Dementijev			+				2
90.	<i>Pandion haliaetus</i> L.			+				2
91.	<i>Neophron percnopterus</i> L.			+			+	2
92.	<i>Aquila chrysaetus daphanea</i> Menzbier		+				+	2
93.	<i>Aquila pennata pennata</i> Gmelin			+			+	2
94.	<i>Accipiter nisus melaschistos</i> Hume			+				2
95.	<i>Falco cherrug coatsi</i> Dementijev		+				+	2
96.	<i>Falco cherrug milvipes</i> Jerdon		+				+	2
97.	<i>Falco peregrinus babylonicus</i> Sclat.	+	+				+	2
98.	<i>Ammoperdix griseogularis</i> Brandt			+				2
99.	<i>Perdix daurica turcomana</i> Stolzm.			+				1
100.	<i>Tetraogallus tibetanus tibetanus</i> Gould.			+			+	2
101.	<i>Phasianus colchicus</i> L.			+			+	2
102.	<i>Otis tarda tarda</i> L.		+				+	1
103.	<i>Otis undulata macqueeni</i> Gray		+				+	1
104.	<i>Burhinus oedicnemus astutus</i> Hartert			+				2
105.	<i>Charadrius mongolus pamirensis</i> Richmond			+				2
106.	<i>Ibidorhyncha struthersi</i> Vigors			+				2
107.	<i>Glareola pratincola</i> L.			+				2
108.	<i>Larus brunnicephalus</i> Jerdon		+					1
109.	<i>Columba palumbus casiotis</i> Bp.			+			+	2
110.	<i>Columba leuconota</i> Vig.			+				2
111.	<i>Pterocles orientalis arenarius</i> Pallas			+				1
112.	<i>Syrnhaptes tibetana</i> Gould.			+			+	1
113.	<i>Apus affinis galilejensis</i> Antorini			+				2
114.	<i>Garrulax lineatus bilkevitchi</i> Zarudny			+				2
115.	<i>Terpsiphone paradisi leucogaster</i> Swain.			+				2
116.	<i>Muscicapa ruficauda</i> Swainson			+				2
117.	<i>Microcichla scouleri scouleri</i> Vigors			+				2
118.	<i>Chaimarrornis leucocephala</i> Vigors			+				2
119.	<i>Myophonus coeruleus turkestanicus</i> Zarudny			+				2
120.	<i>Leptopoeile sophiae sophiae</i> Severtzov			+				2
MAMMALIA								
121.	<i>Paraechinus hypomelas hypomelas</i> Brandt				+			2
122.	<i>Sorex buchariensis</i> Ognev				+		+	2
123.	<i>Suncus etruscus</i> Savi			+				2
124.	<i>Crocidura pergrisea</i> Miller			+				2
125.	<i>Rhinolophus hipposideros</i> Bechstein			+			+	2

Table 3 continued

1	2	3	4	5	6	7	8	9
126.	<i>Rhinolophus ferrumequinum</i> Schreber			+				2
127.	<i>Rhinolophus bocharicus</i> Kastch.et Ak.			+				1
128.	<i>Nyctalus noctula</i> Schreb.			+				2
129.	<i>Myotis emarginatus</i> Geoffroy			+				2
130.	<i>Myotis mystacinus</i> Kuhl			+				2
131.	<i>Plecotus auritus</i> L.			+				2
132.	<i>Barbastella darjelingensis</i> Dobson			+				2
133.	<i>Vespertilio savii</i> Bonaparte			+				2
134.	<i>Vespertilio serotinus</i> Schreber			+				2
135.	<i>Eptesicus ognevi</i> Bobrinskoy			+				2
136.	<i>Eptesicus serotinus turcomanus</i> Eversmann			+				2
137.	<i>Otonycteris hemprichi</i> Peters			+			+	2
138.	<i>Tadarida teniotis teniotis</i> Rafinesque			+			+	2
139.	<i>Spermophilopsis leptodactylus bactrianus</i> Scully			+				1
140.	<i>Marmota menzbieri kaschkarov</i>		+				+	0
141.	<i>Citellus fulvus oxianus</i> Thomas			+				2
142.	<i>Hystrix leucura satunini</i> Muller			+				2
143.	<i>Allactaga severtzovi</i> Vinogradov			+				1
144.	<i>Allactaga elater</i> Lichtenstein			+				1
145.	<i>Vulpes corsac turkmenica</i> Ognev			+				0,3
146.	<i>Ursus arctos isabellinus</i> Horsfield			+			+	
147.	<i>Mustela nivalis pallida</i> Barrett-Hamilton; <i>M.n. heptneri</i> L. Turova			+				2
148.	<i>Mustela altaica sacana</i> Thomas			+				2
149.	<i>Mustela (Putorius) eversmanni talassica</i> Ognev.			+				1
150.	<i>Vormela peregusna koshevnikovi</i> Satunin			+				1
151.	<i>Lutra lutra seistanica</i> Birula		+				+	2
152.	<i>Hyaena hyaena</i> L.			+			+	1
153.	<i>Felis chaus oxiana</i> Heptner			+			+	2
154.	<i>Felis lynx isabellina</i> Blyth			+			+	2
155.	<i>Panthera tigris virgata</i> Illiger		+				+	0
156.	<i>Panthera pardus ciscaucasica</i> Satunin		+				+	0
157.	<i>Uncia uncia</i> Schreber		+				+	2
158.	<i>Gazella subgutturosa</i> Guldenstaedt		+				+	1
159.	<i>Capra falconeri heptneri</i> Zalkin		+				+	1
160.	<i>Ovis vignei bochariensis</i> Nasonov; <i>O.v. severtzovi</i> Nasonov4			+			+	2,3
161.	<i>Ovis ammon polii</i> Blyth			+			+	
162.	<i>Cervus elaphus bactrianus</i> Lydekker		+				+	1

Notes:

- Category 3 – species included in IUCN list
- Category 4-7 – species of global, regional, national and local importance, suggested for reviewing of their status
- Category 8 – species suggested by (IZP AS RT) to be included into SITES list and EC trade regulations
- Category 9 – 0 - extinct; 1- endangered ; 2 - rare; 3 - diminishing.

Table 4. Significant Associations from Natural Ecosystems of Tajikistan

Ecosystems and associations
Nival glacier ecosystems
1. <i>Drabatum (olgae)</i> – <i>Chorisporosum (bungeana)</i> - <i>Ranunculusum (pamiricus)</i> – <i>Astragalusum (alaicus)</i> – <i>Sibaldiosum (tetrandra)</i> ; 2. <i>Dionysietum (involculata)</i> – <i>Polygonosum (ovczinnikovii)</i> .
High-mountain-desert ecosystems
1. <i>Acantholimonetum (pamiricum)</i> – <i>A. (diapensioides)</i> – <i>Onobrychisum (echidna)</i> ; 2. <i>A. (korolkovii)</i> – <i>Festucosum (valesiaca)</i> – <i>Onobrychisum (echidna)</i> ; 3. <i>A.k.</i> – <i>Poosum (relaxa)</i> – <i>Astragaluosum (lasiosemius)</i> ; 4. <i>Oxytropisetum (chiliophyllae)</i> – <i>Potentillosum (sericata)</i> ; 5. <i>Krascheninnikovietum (ewersmannianae)</i> – <i>Stiposum (kirghisorum)</i> ; 6. <i>K.e.</i> – <i>Artemisiosum (rhodantha)</i> – <i>A. (vachanica)</i> ; 7. <i>Ajanietum (tibeticae)</i> – <i>Krascheninnikoviosum (ewersmannianum)</i> ; 8. <i>A.t.</i> – <i>Hordeosum (turkestanicum)</i> .
High-mountain meadow and steppe ecosystems
1. <i>Artemisietum (lehmanniana)</i> – <i>Festucosum (valesiaca)</i> – <i>Ziziphosum (pamiroalaica)</i> ; 2. <i>A.l.</i> – <i>Prangosum (pabularia)</i> – <i>Festucosum (valesiaca)</i> ; 3. <i>Festucetum (valesiaceae)</i> – <i>Lagotium (korolkovii)</i> ; 4. <i>F.v.</i> – <i>Cousiniosum (stephanophora)</i> – <i>C. (alpina)</i> ; 5. <i>F.v.</i> – <i>Cousiniosum (stephanophora)</i> – <i>C. (pannosa)</i> – <i>Geraniosum (saxatile)</i> ; 6. <i>F.v.</i> – <i>Cousiniosum (stephanophora)</i> – <i>C. (pannosa)</i> – <i>Ligulariosum (alpigena)</i> ; 7. <i>F.v.</i> – <i>Polygonosum (coriarum)</i> – <i>Nepetaosum (podostachys)</i> ; 8. <i>F.v.</i> - <i>Thymosum (seravschanicus)</i> – <i>Ziziphosum (pamiroalaica)</i> ; 9. <i>Adonisetum (turkestanicae)</i> – <i>Artemisiosum (dracunculus)</i> – <i>Prangosum (pabularia)</i> ; 10. <i>A.t.</i> – <i>Eremurusum (Kaufmanii)</i> – <i>Euphorbiosum (seravschanica)</i> ; 11. <i>Polygonetum (coriarii)</i> – <i>Prangosum (pabularia)</i> ; 12. <i>P.c.</i> – <i>Nepetaosum (podostachys)</i> – <i>Geraniosum (collinum)</i> ; 13. <i>P.c.</i> – <i>Nepetaosum (podostachys)</i> – <i>Prangosum (pabularia)</i> ; 14. <i>P.c.</i> – <i>Nepetaosum (podostachys)</i> – <i>Ligulariosum (thomsonii)</i> ; 15. <i>P.c.</i> – <i>Nepetaosum (podostachys)</i> – <i>Festucosum (valesiaca)</i> ; 16. <i>P.c.</i> – <i>Prangosum (pabularia)</i> – <i>Dactylosum (glomerata)</i> ; 17. <i>Ligularietum (thomsoniae)</i> – <i>Geraniosum (regelii)</i> – <i>Lagotium (korolkovii)</i> ; 18. <i>L.th.</i> – <i>Prangosum (pabularia)</i> ; 19. <i>L.th.</i> – <i>Artemisiosum (lehmanniana)</i> – <i>Nepetaosum (podostachys)</i> ; 20. <i>Nepetaetum (podostachyae)</i> – <i>Festucosum (valesiaca)</i> ; 21. <i>N.p.</i> - <i>Thymosum (seravschanicus)</i> – <i>Artemisiosum (persica)</i> ; 22. <i>Geranietum (regeliae)</i> – <i>Oxytropisum (savellanica)</i> – <i>Caricosum (orbicularis)</i> ; 23. <i>G.r.</i> - <i>Lagotium (korolkovii)</i> ; 24. <i>Potentilletum (gelidae)</i> – <i>Poosum (bucharica)</i> ; 25. <i>P.g.</i> - <i>Festucosum (alaica)</i> ; 26. <i>P.g.</i> – <i>Ranunculusum (rufosepalus)</i> – <i>Lagotium (korolkovii)</i> ; 27. <i>Cousinietum (pannosae)</i> – <i>Puchineliosum (subspicata)</i> – <i>Poosum (alpinia)</i> – <i>Geraniosum (regelii)</i> – <i>Lagotium (korolkovii)</i> ; 28. <i>C.p.</i> – <i>Puccineliosum (subspicata)</i> ; 29. <i>C.p.</i> – <i>Lagotium (korolkovii)</i> – <i>Oxytropisum (immerse)</i> – <i>Potentillosum (sp. div.)</i> ; 30. <i>C.p.</i> – <i>Festucosum (valesiaca)</i> – <i>Geraniosum (saxatile)</i> ; 31. <i>C.p.</i> - <i>Polygonosum (coriarum)</i> – <i>Geraniosum (regelii)</i> ; 32. <i>C.p.</i> – <i>Festucosum (valesiaca)</i> – <i>Nepetaosum (podostachys)</i> ; 33. <i>Cousinietum (bonvalotii)</i> – <i>Festucosum (valesiaca)</i> – <i>Prangosum (pabularia)</i> ; 34. <i>C.b.</i> – <i>Astragalusum (lasiosemius)</i> ; 35. <i>Cousinietum (franchetii)</i> – <i>Ligulariosum (thomsonii)</i> ; 36. <i>Festucetum (valesiaceae)</i> – <i>Poosum (bactriana)</i> ; 37. <i>F.v.</i> - <i>Caricosum (stenophylloides)</i> ; 38. <i>F.v.</i> – <i>Poosum (relaxa)</i> – <i>Artemisiosum (leucotricha)</i> ; 39. <i>F.v.</i> – <i>Adoniosum (turkestanicus)</i> – <i>Prangosum (pabularia)</i> – <i>Nepetaosum (podostachys)</i> ; 40. <i>Alopecurusetum (seravschanicae)</i> – <i>Polygonosum (coriarum)</i> ; 41. <i>A.s.</i> - <i>Nepetaosum (podostachys)</i> – <i>Polygonosum (coriarum)</i> ; 42. <i>Dactylisetum (glomeratae)</i> – <i>Polygonosum (coriarum)</i> ; 43. <i>D.g.</i> – <i>Nepetaosum (podostachys)</i> ; 44. <i>D.g.</i> - <i>Ranunculusetum (rufosepalus)</i> – <i>Geraniosum (regelii)</i> ; 45. <i>D.g.</i> – <i>Oxytropisetum (savellanicae)</i> – <i>Ranunculusum (rufosepalus)</i> ; 46. <i>D.g.</i> – <i>Caricetum (melanantae)</i> – <i>Trifoliosum (repens)</i> – <i>Potentillosum (gellida)</i> ; 47. <i>D.g.</i> — <i>Cobresietum (persicae)</i> – <i>Caricosum (orbicularis)</i> ; 48. <i>D. g.</i> – <i>Caricetum (pseudo-foetidae)</i> – <i>Alliosum (monodilphum)</i> ; 49. <i>Artemisietum (persicae)</i> – <i>Ligulariosum (thomsonii)</i> – <i>Prangosum (pabularia)</i> ; 50. <i>A.p.</i> – <i>Hypericosum (scabrum)</i> – <i>Ziziphosum (pamiroalaica)</i> .
Mid mountain conifer forests ecosystems
1. <i>Juniperusetum (seravschanicae)</i> – <i>Exochordiosum (albertii)</i> – <i>Poosum (nemoralis)</i> ; 2. <i>J.s.</i> – <i>Polygonosum (coriarum)</i> – <i>Prangosum (pabularia)</i> ; 3. <i>J.s.</i> – <i>Polygonosum (coriarum)</i> – <i>Ferulosum (kuhistanica)</i> ; 4. <i>J.s.</i> – <i>Ferulosum (kuhistanica)</i> – <i>Prangosum (pabularia)</i> ; 5. <i>J.s.</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i> – <i>Veronicosum (biloba)</i> ; 6. <i>J. s.</i> – <i>Populusum (tadshikistanica)</i> – <i>Eremurusum (stenophyllus)</i> – <i>Caricosum (turkestanica)</i> ; 7. <i>J.s.</i> – <i>Poosum (relaxa)</i> – <i>Geraniosum (collinum)</i> ; 8. <i>J.s.</i> – <i>Festucosum (sulcata)</i> – <i>Piptatherosum (pamiroalaicum)</i> ; 9. <i>Juniperusetum (semiglobosae)</i> – <i>Betulosum (tianschanica)</i> – <i>Caricosum (decaulescens)</i> ; 10. <i>J.s.</i> – <i>Festucosum (valesiaca)</i> – <i>Cousiniosum (splendida)</i> ; 11. <i>J.s.</i> – <i>Oligospermusum (dracunculus)</i> ; 12. <i>J. (turkestanicae)</i> – <i>Ligulariosum (thomsonii)</i> – <i>Codonopsiosum (clematidea)</i> ; 13. <i>J.t.</i> – <i>Festucosum (valesiaca)</i> – <i>Geraniosum (collinum)</i> – <i>Companulosum (glomerata)</i> ; 14. <i>J.t.</i> – <i>Festucosum (sulcata)</i> – <i>Elymuosum (alaicus)</i> ; 15. <i>J.t.</i> – <i>Cousiniosum (stephanophora)</i> – <i>Onobrychisum (echidna)</i> – <i>Festucosum (valesiaca)</i> ; 16. <i>J. (sibiricae)</i> – <i>Betulosum (tianschanica)</i> – <i>Astragaluosum (tibetanus)</i> – <i>Agrostiosum (hissarica)</i> ; 17. <i>J.t.</i> – <i>J. (seravschanica)</i> – <i>J. (semiglobosa)</i> – <i>Geraniosum (regelii)</i> – <i>Polygonosum (coriarum)</i> .

Table 4 continued

Mid mountain mesophyllic forests ecosystems
<p>1. <i>Juglanetum (regiae)</i> – <i>Cotoniasterosum (insignis)</i> – <i>Aegopodiosum (tadshicorum)</i>; 2. <i>J.r.</i> – <i>Dactylosum (glomerata)</i> – <i>Elytrigosum (trichophora)</i>; 3. <i>J.r.</i> – <i>Dactylosum (glomerata)</i> – <i>Prangosum (pabularia)</i>; 4. <i>J.r.</i> – <i>Impatiensum (parviflora)</i> – <i>Ligulariosum (thomsonii)</i>; 5. <i>J.r.</i> – <i>Impatiensum (parviflora)</i>; 6. <i>J.r.</i> – <i>Impatiensum (parviflora)</i> – <i>Aegopodiosum (tadshicorum)</i>; 7. <i>Aceretum (turkestanicae)</i> – <i>Prangosum (pabularia)</i> – <i>Aegopodiosum (tadshicorum)</i>; 8. <i>A.t.</i> – <i>Aegopodiosum (tadshicorum)</i> – <i>Impatiensum (parviflora)</i>; 9. <i>A.t.</i> – <i>Prangosum (pabularia)</i> – <i>Scabiosum (songarica)</i>; 10. <i>A.t.</i> – <i>Elytrigosum (trichophora)</i> – <i>Rososum (divina)</i>; 11. <i>A.t.</i> – <i>Dactylosum (glomerata)</i> – <i>Poosum (nemoraliformis)</i>; 12. <i>A.t.</i> – <i>Prangosum (pabularia)</i> – <i>Ferulosum (kuhistanca)</i>; 13. <i>A.t.</i> – <i>Dactylosum (glomerata)</i>; 14. <i>A.t.</i> – <i>Poosum (nemoralis)</i> – <i>Prangosum (pabularia)</i>; 15. <i>A.t.</i> – <i>Aegopodiosum (tadshicorum)</i> – <i>Ferulosum (kuhistanca)</i>; 16. <i>A.t.</i> – <i>Hordeosum (bulbosum)</i> – <i>Dactylosum (glomerata)</i>; 17. <i>Exochordetum (albertii)</i> – <i>Prangosum (pabularia)</i>; 18. <i>E.a.</i> – <i>Poosum (nemoraliformis)</i> – <i>Dactylosum (glomerata)</i>; 19. <i>E.a.</i> – <i>Impatiensum (parviflora)</i>; 20. <i>E.a.</i> – <i>Botriochloosum (ishaemum)</i> – <i>Prangosum (pabularia)</i> – <i>Hordeosum (bulbosa)</i>; 21. <i>Rosaetum (divinae)</i> – <i>Ferulosum (jaeschkeana)</i> – <i>Prangosum (pabularia)</i>; 22. <i>R.d.</i> – <i>R. (kokanica)</i> – <i>Hordeosum (bulbosum)</i> – <i>Ferulosum (kuhistanca)</i>; 23. <i>R. (kokanicae)</i> – <i>Ziziphosum (pamiroalaica)</i> – <i>Organosum (tytthanthum)</i>; 24. <i>Betuletum (tianschanicae)</i> – <i>Ligulariosum (thomsonii)</i> – <i>Caricosum (orbicularis)</i>; 25. <i>B.t.</i> – <i>Geranium (collinum)</i>; 26. <i>B.t.</i> – <i>Polygonosum (coriarum)</i> – <i>Hedysaruosum (flavescens)</i>; 27. <i>B.t.</i> – <i>Polygonosum (coriarum)</i> – <i>Chameriosum (angustifolium)</i>; 28. <i>B.t.</i> – <i>Ribosum (Meyeri)</i> – <i>Alliosum (polyphyllum)</i> – <i>Caricosum (orbicularis)</i>; 29. <i>B.t.</i> – <i>Phragmiteosum (communis)</i> – <i>Poosum (nemoralis)</i>; 30. <i>B.t.</i> – <i>Populusum (tallasca)</i> – <i>Lathyrusum (pratensis)</i>; 31. <i>B.t.</i> – <i>Poosum (pratensis)</i> – <i>Pyrolosum (rotundifolia)</i>; 32. <i>B.t.</i> – <i>Betulosum (procurva)</i> – <i>Trifoliosum (pratense)</i> – <i>Prunellosum (vulgaris)</i>; 33. <i>B.t.</i> – <i>Juniperusum (sibirica)</i> – <i>Thalictrosum (minus)</i>; 34. <i>B.t.</i> – <i>Primulosum (Kaufmanniana)</i> – <i>Cobresiosum (persica)</i>; 35. <i>B.t.</i> – <i>Codonopsiosum (clematidea)</i>; 36. <i>B.t.</i> – <i>Trichophorosum (pumilum)</i>; 37. <i>B.t.</i> – <i>Pyrolosum (rotundifolia)</i> – <i>Galiosum (pamiroalaicum)</i>; 38. <i>B.t.</i> – <i>Polygonosum (Sewerzovii)</i>; 39. <i>B.t.</i> – <i>Artemisiosum (dracunculus)</i>; 40. <i>Hippophaetum (rhamnoideta)</i> – <i>Tamaricosum (arceuthoides)</i> – <i>Saccharosum (spontaneum)</i> – <i>Caricosum (melanantha)</i>; 41. <i>H.rh.</i> – <i>Salicosum (pyncnostachya)</i> – <i>Orchiosum (umbrosa)</i> – <i>Aquilegiosum (vicaria)</i>; 42. <i>H.rh.</i> – <i>Myricariosum (germanica)</i> – <i>Calamagrostiosum (dubia)</i>; 43. <i>Populusetum (tadshikistanicae)</i> – <i>Cynodonosum (dactylon)</i> – <i>Incarvilleosum (olgae)</i>; 44. <i>P.t.</i> – <i>Epipactiosum (latifolia)</i> – <i>Astragalosum (bucharica)</i>; 45. <i>P.t.</i> – <i>Calamagrostiosum (pseudophragmites)</i> – <i>Caricosum (pyncnostachya)</i>; 46. <i>Tamaricetum (arceuthoideta)</i> – <i>Phragmiteosum (communis)</i>; 47. <i>Restelletum (albertiae)</i> – <i>Polygonosum (coriarum)</i> – <i>Ferulosum (kuhistanca)</i>; 48. <i>R.a.</i> – <i>Polygonosum (coriarum)</i> – <i>Prangosum (pabularia)</i>; 49. <i>R.a.</i> – <i>Polygonosum (coriarum)</i> – <i>Nepetaosum (podostachys)</i>.</p>
Mid mountain xerophytic light forest ecosystems
<p>1. <i>Aceretum (regeliae)</i> – <i>Prangosum (pabularia)</i> – <i>Poosum (nemoralis)</i>; 2. <i>A.r.</i> – <i>Prangosum (pabularia)</i> – <i>Ferulosum (kuhistanca)</i>; 3. <i>A.r.</i> – <i>Coluteosum (paulsenii)</i> – <i>Jnulolum (macrophylla)</i>; 4. <i>A.r.</i> – <i>Calophacosum (grandiflora)</i> – <i>Hordeosum (bulbosum)</i> – <i>Avenosum (trychophylla)</i>; 5. <i>A.r.</i> – <i>Hordeosum (bulbosum)</i> – <i>Dactylosum (glomerata)</i>; 6. <i>A.r.</i> – <i>Hordeosum (bulbosum)</i> – <i>Ferulosum (kuhistanca)</i> – <i>Prangosum (pabularia)</i>; 7. <i>A.r.</i> – <i>Calophacosum (grandiflora)</i> – <i>Hordeosum (bulbosum)</i> – <i>Elytrigosum (trichophora)</i>; 8. <i>A.r.</i> – <i>Prangosum (pabularia)</i> – <i>Hordeosum (bulbosum)</i> – <i>Rososum (divina)</i>; 9. <i>A.r.</i> – <i>Ferulosum (gigantean)</i> – <i>Rheuosum (maximowiczii)</i> – <i>Artemisiosum (baldshuanica)</i>; 10. <i>A.r.</i> – <i>Glycyrrhisum (glabra)</i> – <i>Hordeosum (bulbosum)</i> – <i>Dactylosum (glomerata)</i>; 11. <i>A.r.</i> – <i>Prangosum (pabularia)</i> – <i>Organosum (tyttanthum)</i>; 12. <i>Crataeguetum (ponticae)</i> – <i>Botriochloosum (ishaemum)</i> – <i>Glycyrrisum (glabra)</i> – <i>Organosum (tyttanthum)</i>; 13. <i>C.p.</i> – <i>Dactylosum (glomerata)</i> – <i>Hordeosum (bulbosum)</i> – <i>Prangosum (pabularia)</i>; 14. <i>C.p.</i> – <i>Hordeosum (bulbosum)</i> – <i>Elytrigosum (trichophora)</i>; 15. <i>C.p.</i> – <i>Prangosum (pabularia)</i> – <i>Poosum (bulbosa)</i> – <i>Dactylosum (glomerata)</i>; 16. <i>C.p.</i> – <i>Botriochloosum (ishaemum)</i> – <i>Hordeosum (bulbosum)</i> – <i>Glycyrrhisum (glabra)</i>; 17. <i>C.p.</i> – <i>Hordeosum (bulbosum)</i> – <i>Dactylosum (glomerata)</i> – <i>Centaureosum (squarrosa)</i>; 18. <i>Cerciosum (griffithii)</i> – <i>Botriochloosum (ishaemum)</i> – <i>Bromusum (oxyodon)</i>; 19. <i>C.g.</i> – <i>Botriochloosum (ishaemum)</i> – <i>Centaureosum (squarrosa)</i>; 20. <i>C.g.</i> – <i>Avenosum (trichophylla)</i> – <i>Hordeosum (bulbosum)</i> – <i>Anisanthosum (tectorum)</i>; 21. <i>C.g.</i> – <i>Poosum (nemoralis)</i> – <i>Ferulosum (tadshicorum)</i>; 22. <i>C.g.</i> – <i>Prangosum (pabularia)</i> – <i>Organosum (tyttanthum)</i>; 23. <i>C.g.</i> – <i>Jnulolum (macrophylla)</i> – <i>Hordeosum (bulbosum)</i>; 24. <i>Calophacetum (cericea)</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i>; 25. <i>Pistacietum (verae)</i> – <i>Ferulosum (gigantean)</i> – <i>Poosum (bulbosa)</i> – <i>Anisanthosum (tectorum)</i>; 26. <i>P.v.</i> – <i>Artemisiosum (baldshuanica)</i>; 27. <i>P.v.</i> – <i>Prangosum (pabularia)</i> – <i>Hordeosum (bulbosum)</i>; 28. <i>P.v.</i> – <i>Hordeosum (bulbosum)</i> – <i>Jnulolum (macrophylla)</i> – <i>Poosum (bulbosa)</i>; 29. <i>P.v.</i> – <i>Poosum (bulbosa)</i> – <i>Caricosum (pachystylis)</i> – <i>Artemisiosum (baldshuanica)</i>; 30. <i>P.v.</i> – <i>Prangosum (bucharica)</i> – <i>Poosum (bulbosa)</i> – <i>Bromusum (oxyodon)</i>; 31. <i>P.v.</i> – <i>Artemisiosum (baldshuanica)</i> – <i>A. (kochiiformis)</i> – <i>Poosum (bulbosa)</i>; 32. <i>P.v.</i> – <i>Fraxinosum (raibocarpa)</i> – <i>Rososum (kokanica)</i> – <i>Cerciosum (griffithii)</i> – <i>Scabiosum (songarica)</i>; 33. <i>P.v.</i> – <i>Ziziphosum (pamiroalaica)</i> – <i>Hordeosum (bulbosum)</i>; 34. <i>P.v.</i> – <i>Artemisiosum</i></p>

Table 4 continued

Mid and low-mountain semisavanna (savannoide) ecosystems
<p>1. <i>Prangosetum (pabulariae)</i> – <i>Polygonosum (coriarum)</i> – <i>Dactylosum (glomerata)</i> – <i>Poosum (relaxa)</i>; 2. <i>P.p.</i> – <i>Polygonosum (coriarum)</i> – <i>Piptatherosum (alpestre)</i>; 3. <i>P.p.</i> – <i>Dactylosum (glomerata)</i> – <i>Festucosum (valesiaca)</i>; 4. <i>P.p.</i> – <i>Ferulosum (kuhistanica)</i> – <i>Nepetaosum (podostachys)</i>; 5. <i>P.p.</i> – <i>Elymuosum (baldshuanicus)</i> – <i>Polygonosum (coriarum)</i>; 6. <i>P.p.</i> – <i>Artemisiosum (persica)</i> – <i>Hypericosum (scabrum)</i> – <i>Ziziphorosum (pamiroalaica)</i> – <i>Elymuosum (baldshuanicus)</i>; 7. <i>P.p.</i> – <i>Rososum (divina)</i> – <i>Dactylosum (glomerata)</i> – <i>Poosum (relaxa)</i>; 8. <i>P.p.</i> – <i>Festucosum (valesiaca)</i> – <i>Rososum (divina)</i> – <i>Polygonosum (coriarum)</i>; 9. <i>P.p.</i> – <i>Jnulolum (macrophylla)</i>; 10. <i>Feruletum (kuhistanicae)</i> – <i>Prangosum (pabularia)</i> – <i>Artemisiosum (persica)</i> – <i>Nepetaosum (podostachys)</i>; 11. <i>F.k.</i> – <i>Prangosum (pabularia)</i> – <i>Dactylosum (glomerata)</i>; 12. <i>F.k.</i> – <i>Prangosum (pabularia)</i> – <i>Polygonosum (coriarum)</i>; 13. <i>F.k.</i> – <i>Polygonosum (coriarum)</i> – <i>Thymosum (seravschanicus)</i> – <i>Ziziphorosum (pamiroalaica)</i>; 14. <i>F.k.</i> – <i>Adoniosum (turkestanica)</i> – <i>Artemisiosum (persica)</i>; 15. <i>F.k.</i> – <i>Artemisiosum (persica)</i> – <i>Geranium (regelii)</i>; 16. <i>Phlomisium (bucharicae)</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i> – <i>Cynodonosum (dactylon)</i>; 17. <i>Ph.b.</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i>; 18. <i>Ph.b.</i> – <i>Jnulolum (grandis)</i> – <i>Hordeosum (bulbosum)</i>; 19. <i>Jnuletum (macrophyllae)</i> – <i>Onobrychisum (pulchella)</i> – <i>Bromusum (oxyodon)</i>; 20. <i>Hordetum (bulbosa)</i> – <i>Botriochloosum (ishaemum)</i> – <i>Glycyrrhisum (glabra)</i>; 21. <i>H.b.</i> – <i>Botriochloosum (ishaemum)</i> – <i>Jnulolum (macrophylla)</i> – <i>Phlomisium (bucharica)</i>; 22. <i>H.b.</i> – <i>Aegilopsium (triuncialis)</i> – <i>Centaureosum (squarrosa)</i>; 23. <i>H.b.</i> – <i>Dactylosum (glomerata)</i> – <i>Elytrigiosum (trichophora)</i> – <i>Prangosum (pabularia)</i>; 24. <i>H.b.</i> – <i>Jnulolum (macrophylla)</i>; 25. <i>H.b.</i> – <i>Elytrigiosum (trichophora)</i> – <i>Aegilopsium (triuncialis)</i> – <i>Anisanthosum (tectorum)</i>; 26. <i>H.b.</i> – <i>Glycyrrhisum (glabra)</i> – <i>Botriochloosum (ischaemum)</i> – <i>Dactylosum (glomerata)</i>; 27. <i>H.b.</i> – <i>Artemisiosum (baldshuanica)</i> – <i>Hordeosum (bulbosum)</i>; 28. <i>H.b.</i> – <i>Phlomisium (bucharica)</i> – <i>Bromusum (oxyodon)</i>; 29. <i>H.b.</i> – <i>Jnulolum (macrophylla)</i> – <i>Phlomisium (bucharica)</i>; 30. <i>H.b.</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i> – <i>Jnulolum (macrophylla)</i>; 31. <i>H.b.</i> – <i>Phlomisium (bucharica)</i>; 32. <i>H.b.</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i>; 33. <i>H.b.</i> – <i>Prangosum (pabularia)</i> – <i>Centaureosum (squarrosa)</i>; 34. <i>Botriochloetum (ischaemum)</i> – <i>Glycyrrhisum (glabra)</i>; 35. <i>B.i.</i> – <i>Glycyrrhisum (glabra)</i> – <i>Jnulolum (macrophylla)</i>; 36. <i>B.i.</i> – <i>Cynodonosum (dactylon)</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i>; 37. <i>B.i.</i> – <i>Artemisiosum (baldshuanica)</i> – <i>Hordeosum (bulbosum)</i>; 38. <i>B.i.</i> – <i>Hordeosum (bulbosum)</i> – <i>Aegilopsium (triuncialis)</i> – <i>Elytrigiosum (trichophora)</i>; 39. <i>B.i.</i> – <i>Cynodonosum (dactylon)</i> – <i>Aegilopsium (triuncialis)</i>; 40. <i>Elytrigietum (trichophorae)</i> – <i>Hordeosum (bulbosum)</i>; 41. <i>E.t.</i> – <i>Cynodonosum (dactylon)</i>; 42. <i>Cynodonetum (dactylon)</i> – <i>Artemisiosum (baldshuanica)</i> – <i>Hordeosum (bulbosum)</i> – <i>Poosum (bulbosa)</i>; 43. <i>C.d.</i> – <i>Hordeosum (bulbosum)</i> – <i>Cousiniosum (polycephalla)</i>; 44. <i>Caricetum (pachystylis)</i> – <i>Anisanthosum (tectorum)</i> – <i>Bromusum (japonicus)</i> – <i>Gageosum (sp.div.)</i>; 45. <i>C.p.</i> – <i>Hordeosum (leporinum)</i> – <i>Bromusum (oxyodon)</i>; 46. <i>Poetum (bulbosae)</i> – <i>Hordeosum (bulbosum)</i> – <i>Bromusum (oxyodon)</i>; 47. <i>P.b.</i> – <i>Amygdaliosum (bucharica)</i> – <i>Artemisiosum (baldshuanica)</i> – <i>Pistaciosum (vera)</i>; 48. <i>Carieto-Poetum</i> – <i>Botriochloosum (ishaemum)</i>; 49. <i>C.-P.</i> – <i>Alhagiosum (canescens)</i> – <i>Salsolosum (carinata)</i>.</p>
Foothill semisavanna (savannoide) ecosystems
<p>1. <i>Artemisietum (baldshuanicae)</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i> – <i>Hordeosum (bulbosum)</i>; 2. <i>A.b.</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i>; 3. <i>A.b.</i> – <i>Zygophyllosum (gontscharovii)</i>; 4. <i>A. (sogdiana)</i> – <i>Camphorosmosum (lessingii)</i>; 5. <i>A.s.</i> – <i>Caricosum (pachystylis)</i>; 6. <i>Haloxylonetum (persicae)</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i>; 7. <i>H.p.</i> – <i>Salsolosum (richteri)</i> – <i>Caricosum (pachystylis)</i>; 8. <i>Salsoletum (forcipitatae)</i> – <i>S. (turkestanica)</i> – <i>S. (richteri)</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i>; 9. <i>Tamaricetum (hispidae)</i> – <i>Halostachysum (caspica)</i>; 10. <i>Halostachyetum (caspicae)</i> – <i>Salsolosum (orientalis)</i> – <i>Tamaricosum (hispidae)</i>; 11. <i>Haloxylonetum (aphyllumae)</i> – <i>Alhagiosum (canescens)</i>; 12. <i>Calligonetum (grisea)</i> – <i>Bromusum (oxyodon)</i> – <i>Hordeosum (leporinum)</i>.</p>
Wetland ecosystems
<p>1. <i>Populusetum (pruinosa)</i> – <i>Phragmiteosum (communis)</i>; 2. <i>P.p.</i> – <i>Phragmiteosum (communis)</i> – <i>Thyphosum (angustifolia)</i>; 3. <i>P.p.</i> – <i>Imperatosum (cylindrica)</i> – <i>Glycyrrhisum (glabra)</i>; 4. <i>P.p.</i> – <i>Glycyrrhisum (glabra)</i> – <i>Tamaricosum (hispidae)</i> – <i>Erianthusum (ravena)</i>; 5. <i>Elaeagnetum (angustifoliae)</i> – <i>Lyciosum (ruthenicum)</i> – <i>Typhosum (angustifolia)</i>; 6. <i>Tamaricetum (ramosissima)</i> – <i>Phragmiteosum (communis)</i> – <i>Populusum (pruinosa)</i>; 7. <i>T.r.</i> + <i>Erianthusum (ravena)</i> – <i>Caricosum (pachystylis)</i> – <i>Poosum (bulbosa)</i>; 8. <i>Tamaricetum (hispidae)</i> – <i>Climacopterium (bucharica)</i> – <i>Glycyrrhisum (glabra)</i>.</p>

Table 5. List of Projects Requiring International Assistance

<p>1. Inventory of biological diversity, ecosystems and habitats (see the General Action Plan – B₃, B₄, B₅, B₆, B₈, B₁₀, B₁₁, B₁₄, C₅, C₈, C₉, C₁₀). Tasks:</p> <ul style="list-style-type: none"> • Inventory and critical analysis of the biological diversity of Republic of Tajikistan. • Inventory and classification of ecosystems of Republic of Tajikistan. • Creation of national cadastre of natural objects (valuable communities, ecosystems, geosystems), elaboration of legislative base for their conservation and inclusion into the global nature-cultural heritage. • Elaboration of maps on biogeographical and territorial units. • Elaboration of maps on nature protected areas and its zonation according to biogeographical principle.
<p>2. Establishment of the National Ecological Network (see the Action Plan for creating the National Ecological Network – A₆, B₁, B₃, B₄, B₅, C₁, C₂). Tasks:</p> <ul style="list-style-type: none"> • Elaboration of the concept of the Ecological Network. • Identification of the ecologically significant habitats and elaboration of its maps. • Identification of the ecologically significant habitats of regional importance and their connection to the Global Ecological Network.
<p>3. Conservation of mountain landscape biodiversity of Tajikistan (see the Action Plan on biodiversity conservation at geosystem level – B₁, B₂, B₃, B₇, B₈, B₁₀, B₁₄, C₁, C₃). Tasks:</p> <ul style="list-style-type: none"> • Elaborating programs on improvement of the ecological state of alpine and subalpine meadows in Central and northern Tajikistan (see the Action Plan on the ecosystems conservation). • Rehabilitation and improvement of water-protected zones and water ecosystems in Amudarya River basin.
<p>4. Improvement and establishment of the monitoring system over biodiversity of high-mountain ecosystems. (see the Action Plan on conservation of nival glacier, high-mountain desert, high-mountain meadow and steppe ecosystems: nival glacier – B₁, C₂, high-mountain desert– A₁, B₂, B₄, C₂, C₃, C₆, high-mountain meadow and steppe – B₂, C₁, C₃). Tasks:</p> <ul style="list-style-type: none"> • Elaborating programs on conservation and extending areas of natural fruit and nut forests of global importance. • Elaborating projects on the biodiversity monitoring points rehabilitation (biological stations, botanical stationeries, agrobiocoenosis sites, biological laboratories). • Elaboration and creation of information biodiversity center.
<p>5. Conservation of mountain forests (see the Action Plan on conservation the mountain-forest ecosystems: mid-mountain conifer forest – A₃, B₂, B₃, B₄, B₅; mesophyllic forest – B₁, B₄, B₆, B₈, C₂, C₃, C₅; mid-mountain xerophytic light forest – B₁, B₄, C₁, C₂, C₄). Tasks:</p> <ul style="list-style-type: none"> • Elaborating projects and programs on conservation and rehabilitation of juniper forests of Central Tajikistan and Western Badakhshan. • Elaborating projects on conservation and rehabilitation of birch forests. • Elaborating projects on protection of nut forests, wild apple and pear forests.
<p>6. Conservation of biodiversity of low-mountain foothill and valley landscapes (see the Action Plan on conservation the low-mountain semisavanna (savannoide), foothill semidesert and desert, wetland ecosystems: low-mountain semisavanna (savannoide) – B₂, C₃, C₄, foothill semidesert and desert – B₄, C₁, C₂, C₃, wetland– B₁, B₃, B₄, B₈, B₉, B₁₀, C₁, C₂, C₄, C₅). Tasks:</p> <ul style="list-style-type: none"> • Elaboration of the concept of rehabilitation of the tugai and desert ecosystems. • Elaborating projects on reorganization and improvement of the protected areas state. • Elaborating management projects on the protected areas and their partial reorganization.
<p>7. Conservation of rare and endangered species and communities (see the Action Plan on species <i>in-situ</i> and <i>ex-situ</i> conservation: <i>in-situ</i> – B₁, B₃, B₄, B₅, B₇, B₉, B₁₀, B₁₁, B₁₃, B₁₄, B₁₅, B₁₉, B₂₅, C₁, C₂; <i>ex-situ</i> – B₁, B₂, C₂, C₆). Tasks:</p> <ul style="list-style-type: none"> • Elaboration of mechanisms of species protection of genetic importance. • Elaborating and organization of protection of valuable communities of regional importance. • Species protection registered in the Red Data Book.
<p>8. Educational and informational programs (see the Action Plan on the component educational activities). Tasks:</p> <ul style="list-style-type: none"> • Population awareness on the importance of biodiversity protection by radio and television. • Different social groups awareness by publication of books, booklets, advertizing, pictures, etc. • Organization of workshops, round-tables, lectures and trainings on biodiversity with personnel of various institutions and the population, etc.

Table 6. Main objectives of biodiversity conservation

Conservation level	Decision level			
	Global	Central Asian	National	Local
IN-SITU CONSERVATION				
Geosystem level				
G ₁	+	+	+	+
G ₂		+	+	+
G ₃	+	+	+	+
G ₄			+	+
G ₅		+	+	+
G ₆	+	+	+	–
G ₇	+	+	+	–
G ₈	+	+	+	–
Ecosystem level				
E ₁ , E ₂ , E ₃	+	+	+	+
E ₄			+	+
E ₅ , E ₆ , E ₇ , E ₈ , E ₁₁		+	+	+
E ₉	+	+	+	
Species level				
S ₁ , S ₂ , S ₃ , S ₇	+	+	+	+
S ₄ , S ₅ , S ₆ , S ₈		+	+	+
Genetic level				
V ₁ , V ₂ , V ₄	+	+	+	+
V ₃ , V ₅		+	+	+
EX-SITU CONSERVATION				
ExS ₁ , ExS ₂ , ExS ₃	+	+	+	+
ExS ₄ , ExS ₅		+	+	+

BIBLIOGRAPHY

1. Абдусаломов И.А. Фауна Таджикской ССР. // Птицы. Т.19, ч.1, 2, 3, Д.: Дониш, 1971, 1973, 1977. – 403 с.
2. Абдусаломов И.А., Давыдов Г.С., Соков А.И., Грищенко Е.В. Редкие и исчезающие животные Таджикистана. Д.: Дониш, 1976. – 123 с.
3. Авдеев В.И. Жизненность популяций некоторых дикорастущих плодовых культур. // Охрана и рациональное использование растительного мира Таджикистана. / Тез. докл. Респ. научн.-практ. конф., секция «Ботаника», Д.: 1984. – С.14-15.
4. Агаханянц О.Е. Основные проблемы физической географии Памира. АН Тадж.ССР, ч.1, 2, Д.: 1965, 1966. – 214, 241 с.
5. Агаханянц О.Е., Юсуфбеков Х. Ю. Растительность Западного Памира и опыт ее реконструкции. Д.: 1975. – 200 с.
6. Акназаров О.А. Некоторые итоги и перспективы исследования биологических ресурсов Памира. // Изв. АН РТ, отд. биол. наук, №3 (108), 1987. – С.56-65.
7. Андриевская С.А. Альгофлора пойменных водоёмов среднего течения реки Вахш // Изв. АН РТ, отд. биол. наук. №1 (129), 1993. – С.21-25.
8. Антипов-Каратаев И.Н. О почвах южных склонов Гиссарского хребта в Таджикистане // Тр. Тадж. фил. АН СССР. Почвоведение и мелиорация, Т.20. 1949. – С.40-50.
9. Атлас Таджикской Советской Социалистической Республики. Изд. ГУГК при Совете Министров СССР. Д.-М.: 1968. – 200 с.
10. Афанасьев К.С. Растительность Таджикистана и ее освоение. // Тр. Тадж. База АН СССР, Т.8, 1940. – С.163-217.
11. Ашуров А.А. Итоги деятельности Варзобской горной ботанической станции. // Изв. АН РТ, отд. биол. и мед. наук, №5 (146), 2001. – С.38-42.
12. Бабаев Т.Б. Итоги интродукционных работ Кулябского ботанического сада за 15 лет. // Изв. АН РТ, отд. биол. и мед. наук, №5 (146). – С.76-79.
13. Баева В.Г. Фауна Таджикской ССР. // Псиллиды, или листоблошки (*Homoptera, Psyllioidea*). Т.8. Д.: 1985. – 330 с.
14. Базаров Б.Б., Шмелев Г.П. Фауна Таджикской ССР. // Щитовки (*Homoptera, Coccoidea*) Таджикистана и сопредельных территорий Средней Азии. Т.11, вып.1. Д.: 1971. – 238 с.
15. Баранов П.А., Райкова И.А. Дарваз и его культурная растительность. // Изв. общ-во для изучения Тадж. иранский народн. за его пределами. Т.1. Ташкент, 1928. – С.1-108.
16. Бардашев И.А. Конодонты. // Атлас ископаемой фауны и флоры Таджикистана. Ордовик. Силур. Девон. – Д.: Дониш, 1990. – С.214-245.
17. Бобораджабов Б. Материалы к флоре печеночных мхов Таджикистана. // Изв. АН Тадж.ССР, отд. биол. наук, №4 (57), 1974. – С.3-7.
18. Бобораджабов Б., Маматкулов У.К. О печеночных мхах Средней Азии. // Изв. АН Тадж.ССР, отд. биол. наук, №4 (57), 1974. – С.3-7.
19. Боргаренко Л.Ф. Гельминты птиц Таджикистана. // Нематоды. Кн. 3. Д.: 1990. – 259 с.
20. Боргаренко Л.Ф. Гельминты птиц Таджикистана. // Трематоды. Кн. 2. Д.: 1984. – 210 с.
21. Бузруков А.Д., Сафаров Н.М. Проблемы и перспективы сбалансированного развития Республики Таджикистан. // Проблемы экологически сбалансированного развития стран с переходной экономикой. М.: ГЕОС, 2000. – С.102-113.
22. Быков Б.А. Доминанты растительного покрова Советского Союза. Т.1, 2, 3. Изд. АН Каз.ССР, Алма-Ата, 1960, 1962, 1965.
23. Быков Б.А. Экологический словарь. Алма-Ата: Наука Казахской ССР, 1988.
24. Виноградов Б.С., Иванов А.И. Грызуны Таджикистана. Сталинабад: Таджикгосиздат, 1945. – 84 с.
25. Виноградов Б.С., Павловский Е.Н., Флеров К.К. Звери Таджикистана, их жизнь и значение для человека. Изд. АН СССР, М.-Л.: 1935. – 276 с.

26. Вопросы сохранения и рационального использования растительного биоразнообразия Таджикистана. / Материалы конференции. Д.: 2002. – 200 с.
27. Вторая Международная научная конференция «Экологические особенности биологического разнообразия». / Тезисы докладов. Изд. ОО НПЦ ОГРТ, Д.: 2002. – 210 с.
28. Гафуров А.К. Мермитиды (систематика, биология, филогения, практическое значение). Д.: 1997. – 381 с.
29. Гончаров Н.Ф. Районы флоры Таджикистана и их растительность. // В кн. Флора Тадж.ССР Т.5, Изд. АН СССР, М.-Л.: 1937. – С.20-45.
30. Грубов В.И. Платановые. // Деревья и кустарники СССР. Т.3. Изд. АН СССР М.-Л.: 1954. – С.30-150.
31. Гурский А.В. Естественные леса-сады Горно-Бадахшанской автономной области Таджикской ССР. // В сб.: Интродукция растений в Памирском ботаническом саду. Д.: Дониш, 1972. – С.47-58.
32. Давлятов А., Дарвозиев М. Материалы к анализу флоры заповедника Ромит. // Матер. юбил. научно-практич. конф., посвященной 50-летию ТГНУ Д.: 1998. – С.104.
33. Давыдов Г.С. Фауна Таджикской ССР. // Млекопитающие (грызуны). Т.20, ч.3. Д.: Дониш, 1988. – 315 с.
34. Давыдов Г.С. Фауна Таджикской ССР. // Млекопитающие (зайцеобразные, суслики и сурки). Т.20, ч.1. Д.: Дониш, 1974. – 258 с.
35. Закиров К.З. Флора и растительность бассейна реки Зеравшан. ч.І. Изд. АН Уз.ССР, Ташкент, 1955. – С.9-110.
36. Закиров К.З. Флора и растительность бассейна реки Зеравшан. ч.ІІ. // Конспект флора. Изд. АН Уз.ССР, Ташкент, 1961. – 436 с.
37. Закон Республики Таджикистан «Об особо охраняемых природных территориях». Д.: 1996.
38. Закон Республики Таджикистан «Об охране природы». Д.: 1994.
39. Заповедник Тигровая балка. // Тр. Инст-та зоологии и паразитологии, Т.15, вып.1. Д.: 1959. – 201 с.
40. Запрягаева В.И. Главнейшие древесные породы Таджикистана для горного богарного лесоразведения. Изд. АН СССР. 1954. – С.75-35.
41. Запрягаева В.И. Дикорастущие плодовые Таджикистана. М.-Л.: Наука, 1964. – 679 с.
42. Запрягаева В.И. Лесные ресурсы Памиро-Алая. Л.: Наука, 1976. – 595 с.
43. Земельный кодекс РТ, Д.: 13.12.1996.
44. Земельный фонд РТ по состоянию на 01. 01. 2001г., Госкомзем РТ, Д.: 2001. – 176 с.
45. Иванов А.И. Птицы Памиро-Алая. Л.: Наука, 1969. – 448 с.
46. Иконников С.С. Определитель растений Бадахшана. Л.: Наука, 1979.
47. Иконников С.С. Определитель растений Памира. Д.: 1963.
48. Исмаилов М.И. Ботанико-географический обзор можжевельников (*Junipers L.*) в связи с их происхождением и развитием. // В сб. Вопросы экологии и географии растений. Д.: 1974 а. – С.15-40.
49. Исмаилов М.И. Определитель сосудистых растений Таджикистана. // Деп. в НПЦЦентре, вып. 2, №44 (1186), Д.: 1999. – 1139 с.
50. Исмаилов М.И. Очерк древесной и кустарниковой растительности Юго-западных отрогов Дарвазского хребта. // Тр. Каф. ботаники ТГУ, №3, 1971. – С.1-100.
51. Камелин Р.В. Флорогенетический анализ естественной флоры Горной Средней Азии. Л.: Наука, 1973. – 356 с.
52. Кириченко А.Н. Полужесткокрылые (*Himiptera, Heteroptera*) Таджикистана. Д.: 1964. – 258 с.
53. Кожамкулова Б.С. Раннеантропогенные млекопитающие Таджикистана (обзор находок остатков). // Биостратиграфическое и палеобиофацальные исследования и их практическое значение. – М.: Наука, 1970. – С.59-61.
54. Конвенция о водно-болотных угодьях, 2000.
55. Конвенция по сохранению мигрирующих видов, 2000.

56. Конвенция о биологическом разнообразии, UNEP (CBD) 94/1. 1995.
57. Конвенция по борьбе с опустыниванием, 1997.
58. *Коннов А.А.* Флора арчовников Шахристана. Д.: Дониш, 1973. – С.176.
59. *Коровин Е.П.* Растительность Средней Азии и Южного Казахстана. // Кн. 1, 2. Изд. АН Уз.ССР, Ташкент, 1961, 1962.
60. *Коровин Е.П., Короткова Е.Е.* Типы растительности Средней Азии. // Труды Среднеазиатск. унив., 8, 1946.
61. *Кочкарева Т. Ф.* Обзор шиповников – *Rosa L.* Таджикистана. // Растительность Таджикистана и ее освоение. Д.: Дониш, 1974. – С.125-145.
62. Красная книга МСОП. // Млекопитающие. М.: Прогресс, 1976.
63. Красная книга СССР. // Млекопитающие. Т.1. М.: Лесная промышленность, 1984. – 390 с.
64. Красная книга Таджикской ССР. Д.: Дониш, 1988. – С.163-328.
65. *Кутеминский В.Я., Леонтьева Р. С.* Почвы Таджикистана. Д.: Ирфон, 1966. – 226 с.
66. *Лелешус В.Л.* Восемь максимумов биоразнообразия в фанерозое Средней Азии. Геология и минеральные ресурсы Республики Таджикистан. Д.: 2001. – С.61-66.
67. *Мадаминов А.А.* Влияние климатических факторов на первичную продуктивность травяных экосистем Западного Памиро-Алая // Тр. Ин-т ботаники АН РТ. Д.: 2001. – 15 с.
68. *Максунов В.А.* Промысловые рыбы Таджикистана. Д.: Дониш, 1968. – 99 с.
69. *Маматкулов У.К.* Материалы к бриофлоре Восточного Памира // Изв. АН Тадж.ССР, отд. биол. наук. 14 (25), 1966. – С.36-46.
70. *Маматкулов У.К.* Мхи Восточного Памира. // Растительный мир и его освоение. / Проблемы ботаники, 12, Л.: Наука, 1974. – С.84-88.
71. Материалы научной конференции, посвященной 60-летию образования Института зоологии и паразитологии им. Е.Н. Павловского АН РТ. Д.: 2001. – 90 с.
72. *Молотковский Ю.И.* Биологическая продуктивность некоторых тугайных сообществ низовья р. Вахш. // Докл. АН Тадж.ССР. Т.11, №12, 1968.
73. *Муминов Н.Н., Баева В.Г., Назиров В.* О насекомых Таджикистана. Изд. ООО НПЦ ОГРТ, Д.: 2000. – 51 с.
74. *Мухаммадиев С.А.* Гельминты крупного рогатого скота и яков Таджикистана. Д.: 1981. – 183 с.
75. *Назаров М.Н.* Формация прангоса кормового в высокогорьях Гиссаро-Дарваза // В кн.: Проблемы ботаники. Т.12, Л.: Наука, 1974.
76. *Назиров Х.Н.* Местные сорта яблони Таджикистана. // Садоводство №12, 1990. – С.16-18.
77. *Нарзикулов М.Н.* Фауна Таджикской ССР. // Тли (*Homoptera, Aphididae*) Таджикистана и сопредельных районов Средней Азии. Т.9, вып.1, Д.: 1962. – 272 с.
78. *Невский С.А.* Материалы к флоре Кугитанга и его предгорий. // В кн.: Флора и систематика высших растений, вып. 4, Изд. АН СССР, М.-Л.: 1937. – С.554-583.
79. О концепции Национальной стратегии сохранения биоразнообразия. // Таджикистан. / Сохранение жизни на земле. Д.: 2001. – С.6.
80. *Овчинников П. Н., Сидоренко Г.Т., Калеткина Н.Г.* Растительность Памиро-Алая. Д.: 1973. – 49 с.
81. *Овчинников П.Н.* К истории растительности юга Средней Азии. // Современная ботаника, №3, 1940.
82. *Овчинников П.Н.* О главнейших типах древесной растительности. // Сообщ. Тадж. фил. АН СССР, вып. 6, 1948.
83. *Овчинников П.Н.* Основные черты растительности и районы флоры Таджикистана. // В кн.: Флора Таджикской ССР. Т.VII. Изд. АН СССР, М.-Л.: 1957 б. – С.1-15.
84. *Овчинников П.Н.* Ущелье р. Варзоб, как один из участков ботанико-географической области Древнего Средиземья. // В кн.: Флора и растительность ущелья р. Варзоб. Т.2. Л.: Наука, 1971. – С.200-260.
85. *Овчинников П.Н., Сидоренко Г.Т. и др.* Пастбища и сенокосы Таджикистана. Д.: Дониш, 1977. – 304 с.

86. *Одинашоев А.* Зайцеобразные и грызуны Памира. Д.: Дониш, 1987. – 172 с.
87. Основы палеонтологии. Млекопитающие. // *Коллектив авторов.* М.: Госгеолтехиздат. 1962. – 421 С.
88. От разработки политики к ее осуществлению. // Решения пятого совещания Конференции сторон Конвенции о биологическом разнообразии. Найроби, Кения, UNEP, 2002.
89. Отчет земельных ресурсов Таджикистана. // Госкомзем РТ, 1990-2000
90. *Пахомов М. М.* Ископаемая плиоцен-древнечетвертичная флора Юго-Западного Памира. // Докл. АН СССР, Т.156, №2, 1964.
91. *Печникова С.С.* Внутривидовая изменчивость таджикостанских орехов *Juglans regia L.* в ущелье р. Кондара. // В кн.: Растительность Таджикистана и ее освоение. Т.VIII, М.-Л.: 1940. – С.307-358.
92. *Печникова С.С.* Таджикистанские орехи бассейна р. Такоба. // В кн.: Растительность Таджикистана и ее освоение. Т.VIII, М.-Л.: 1940. – С.350-383.
93. *Попов М. Г.* Дикие плодовые деревья и кустарники Средней Азии. // Тр. по прикладной ботанике, генетике и селекции. Т.XXII. вып.3. 1929. – С.45-65.
94. *Попов М.Г.* Основные черты истории и развития флоры Средней Азии. // Бюлл. САГУ, №5, 1927.
95. *Попов М.Г.* Основы флорогенетики. Изд. АН СССР, М.: 1963.
96. Программа грядущих перемен. // Решения четвертого совещания Конференции сторон Конвенции о биологическом разнообразии. ООН, Нью-Йорк и Женева, 1998.
97. *Протасов В.Ф.* Словарь экологических терминов и понятий. М.: Финансы и статистика, 1997.
98. Рамочная конвенция ООН об изменении климата, 1998.
99. Растения для декоративного садоводства Таджикистана. М.: Наука, 1986. – 484 с.
100. Растительность Казахстана и Средней Азии. // Пояснительный текст и легенда к карте и карта. М.-С.-П.: 1995.
101. *Рахимов С.* Жизненные формы растений основных флороценотивов Таджикистана. // Вопросы сохранения и рационального использования растительного биоразнообразия Таджикистана. / Мат. конфер., Д.: 2002. – С.71-81.
102. *Реймерс Н.Ф.* Природопользование: Словарь-справочник. М.: Мысль, 1990.
103. Решения шестого совещания Конференции сторон Конвенции о биологическом разнообразии. Гаага, Нидерланды, 2002.
104. *Ржепаковская С.С.* О съедобных грибах Таджикистана // Изв. АН РТ. Отд. биол. наук. №1 (129). 1993. – С.5-8.
105. *Саудалиев С.А.* Земноводные и пресмыкающиеся Таджикистана. Д.: Дониш, 1979. – 145 с.
106. *Саидов А.С.* Грызуны Юго-Западного Таджикистана (фауна, систематика, экология, ландшафтное размещение, воздействие антропогенных факторов, зоогеография, биоценологические связи, практическое значение). // Автореф. дисс. на соиск. уч. степ. к.б.н. Д.: 2000. – 24 с.
107. *Саидов А.С., Муминов Н.Н.* Влияние антропогенных факторов на биологическое разнообразие животных в Таджикистане. // Материалы научной конференции, посвященной 60-летию образования Инст. зоологии и паразитологии им. Е.Н.Павловского АН РТ, Д.: 2001. – С.80-85.
108. *Сапожников Г.Н.* Дикие бараны Таджикистана. Д.: Дониш, 1976.
109. *Сапожников Г.Н.* Рациональное использование и охрана природных богатств Таджикистана. Д.: 1967. – 75 с.
110. *Сафаров Н.М.* Ареалогический анализ флоры березняков Памиро-Алая. // Изв. АН Тадж. ССР, отд. биол. наук. №2 (83), 1981. – 101 с. (Рукопись Деп. в ВНИИ 22 апреля 1981, №1830-81).
111. *Сафаров Н.М.* Материалы к классификации горных экосистем Памиро-Алая. // Вопросы сохранения и рационального использования растительного биоразнообразия Таджикистана. / Мат. конфер., Д.: 2002. – С.85-104.
112. *Сафаров Н.М.* Особенности экологического районирования Таджикистана. // Вопросы сохранения и рационального использования растительного биоразнообразия Таджикистана. / Мат. конфер., Д.: 2002. – С.26-42.

113. Сафаров Н.М. Современное состояние и охрана растительности Таджикистана. // Состояние природной среды в Республике Таджикистан в 1992-1994 гг. (Национальный доклад). Д.: 1996. – С.142-143.
114. Сафаров Н.М. Состояние биологических ресурсов Таджикистана в 1990-1991 годах. (Национальный доклад). Д.: 1993.
115. Сафаров Н.М. Состояние окружающей среды. // Таджикистан, отчет по человеческому развитию ПРООН. Д.: 1998. – С.102-109.
116. Сафаров Н.М. Экосистемы Таджикистана. Экологические особенности биологического разнообразия. // Мат. Второй Международной Конференции. / Тез. Докладов, Д.: 2002. – С.153-155.
117. Сафаров Н.М., Курбанбеков З.К., Сидоренко Г.Т. и др. Карта «Растительность Таджикистана М 1:500000 и пояснительный текст». // Природные ресурсы Таджикской ССР.Т.2. Изд. ГУГК, Д.-М.: 1983.
118. Сафаров Н.М., Мухабатов Х. Экологическое районирование и стратегия развития горных регионов Таджикистана. // Материалы Международной конференции «Высокогорные исследования: Изменения и перспективы в XXI веке» Бишкек, 1996. – С.23-234.
119. Сафаров Н.М., Растительные ресурсы Таджикистана. // Состояние природной среды в Республике Таджикистан в 1990-1991 гг. (Национальный доклад). Д.: 1993. – С.56-64.
120. Сельскохозяйственная энциклопедия. Изд. Советская энциклопедия, 1989. – 655 с.
121. Сидоренко Г.Т. Растительность и кормовые ресурсы Кураминского хребта. // Тр. ин. ботаники АН Тадж.ССР. Т.1, 1953. – 210 с.
122. Сидоренко Г.Т., Овчинников П.Н. Природные кормовые угодья // Атлас Таджикской ССР. ГУГК СССР, Д.-М.: 1968. – С.158-159.
123. Сидоренко Г.Т., Сафаров Н.М. Карта растительности Юго-Западного Таджикистана и пояснительный текст на основе материалов картографической съемки (М 1:500000). М.-Д.: 1976.
124. Синьковский Л.П., Кудряшова О.И. Изучение растительных ресурсов Таджикистана // Растительные ресурсы, вып. 3. 1967. – С.395-403.
125. Синьковский Л.П., Мадаминов А.А. Пастбища низкотравных полусаванн Средней Азии. Д.: Дониш, 1989. – 268 с.
126. Скворцов А.К. *Betulaceae* – Березовые. // В кн.: Определитель растений Средней Азии. Т.3, Изд. Фан, Ташкент, 1972.
127. Словарь терминов и понятий, связанных с охраной живой природы. М.: 1982.
128. Соков А.И. Бухарский олень (экология, охрана и меры по восстановлению численности). Д.: Дониш, 1987. – 45 с.
129. Соков А.И. Фауна Таджикистана. // Млекопитающие – парнокопытные. Т.20, ч.5. Д.: Дониш, 1993. – 337 с.
130. Сперанский В. Г. Развитие плодоводства и освоение дикорастущих плодовых Таджикистана. // Тр. Тадж.-Памирск. эксп., вып. IV. М.-Л.: 1936.
131. Станюкович К.В. Растительность гор СССР. Д.: Дониш, 1973. – 416 с.
132. Статистический ежегодник Республики Таджикистан. Д.: 2000.
133. Стрункова З.И. Фауна Таджикистана. // Тетраниховые клещи. Т.6. Д.: 1992. – 408 с.
134. Таджикистан. // Отчет по человеческому развитию. ПРООН, 1998, 2001.
135. Таджикистан. // Природа и природные ресурсы. Д.: Дониш, 1982. - 601 с.
136. Таджикская советская энциклопедия. Д.: 1984. – 504 с.
137. Толмачев А.И. Ледниковый период и история развития растительности Памиро-Алая. // ТФ АН СССР, №7, 1944.
138. Туракулов И. Эндемичные растения Моголтау-Кураминского округа. // Матер. Междунар. конф. / Экологические особенности биологического разнообразия в Республике Таджикистан и сопредельных территорий. Худжанд, 1998. – С.93-94.
139. Умаров Ш.А., Муминов Н.Н. Биоэкологические исследования и охрана окружающей среды. Охрана природы Таджикистана, вып.3, Д.: 1983.
140. Ущелье Кондара. М.-Л.: 1951. – 421 с.

141. Фарсыханов С.И., Степанов Д.В. и др. Животноводство Таджикистана. Д.: 1985. – 176 с.
142. Фауна и зоогеография насекомых Средней Азии. Д.: 1966. – 261 с.
143. Флора и растительность ущелья реки Варзоб. Л.: Наука, 1971. – 511 с.
144. Флора Таджикской ССР. ТТ. I-X. Л.: Наука, 1957-1991.
145. Хабиров Т.К. Фауна Республики Таджикистан. Т.20, ч.7. Д.: Дониш, 1992. – 352 с.
146. Хисориев Х. Альгофлора Памира: История изучения и видовой состав. Альгология, 5, №3. 1995. – С.311-324.
147. Хисориев Х. О центрально-азиатских эндемичных таксонах ELENOPHUTA. // Вопросы сохранения и рационального использования растительного биоразнообразия Таджикистана. / Мат. конфер., Д.: 2002. – С.10-18.
148. Ходжиматов М. Ясенец таджикский, его биологические особенности и возможности использования в народном хозяйстве. // Автореф. дисс. на соиск. уч. степ. к.б.н., 2000. – 20 с.
149. Холдоров У.Х. Грецкий орех перспектива его выращивания. // В кн. Флора и растительность ущелья реки Варзоб. Л.: Наука, вып.4, 1971. – С.314-316.
150. Холдоров У.Х. Некоторые вопросы выращивания грецкого ореха в Таджикистане // В кн.: Материалы совещания по развитию ореховодства. Изд. «Киргизстан», Фрунзе, 1970.
151. Центральная Азия 2010. Перспективы человеческого развития. // Региональное бюро по странам Европы и СНГ. ПРООН, 1999.
152. Цулая В.И. Цитрусовые культуры в Таджикистане. Д.: 1983.
153. Чернов С.А. Фауна Таджикской ССР. // Пресмыкающиеся. Т.18. Сталинабад, 1959. – 203 с.
154. Чернышев В.И. Фауна и экология млекопитающих тугаев Таджикистана. // Тр. АН Тадж.ССР. Т.85. Сталинабад, 1958. – 168 с.
155. Численность населения Республики Таджикистан. // Статистический сборник за 1990-1998.
156. Чукавин И.Г. Деревья и кустарники южного склона Дарвазского хребта и их участие в растительном покрове. // Изв. АН Тадж.ССР, отд. биол. наук. вып.4. 1966. – С.10-20.
157. Щеткин Ю.Л., Муминов Н.Н. Охрана редких и исчезающих беспозвоночных животных Таджикистана. // Охрана природы Таджикистана, вып. 3, Д.: 1983. – С.20-38.
158. Экологический словарь / Сост. Деляцкий С., Зайонц И., Чертков Л., Экзарьян В. – М.: Конкорд Лтд – Экопром, 1993.
159. Экологический энциклопедический словарь. Кишинев, 1989.
160. Энтомология Таджикистана. // Сб. статей. Д.: 1975. – 239 с.
161. Юсуфбеков Х.Ю. Улучшение пастбищ и сенокосов Памира и Алайской долины. Д.: Дониш, 1968. – 320 с.
162. Biodiversity Conservation in Central Asia // Editors: V.Krever, O.Pereledova, M.Williams, H.Lungius. Almaty-Ashgabad-Bishkek-Dushanbe-Tashkent-C.-Land-Moscow. Washington, 1998.
163. Evans F.C. Ecosystem as the basic unit in ecology, Science, 123, 1956. – P.1227-1228.
164. Madaminov A.A. Changing Structures and Productivity of Different Types of Grassland under Anthropogenic Influence in Tajikistan // Proceeding EUROMAB – Symposium (15-19 September 1999, Vienna). Vienna, 2000. – P.97-99.
165. Safarov N., Novikov V. Tajikistan. // State of the Environment. Dushanbe, 2002.
166. World Resources 2000-2001. People and Ecosystem. The Fraying Web of Life. UNDP, UNEP. World Bank, World Resources institute. Washington, D.C., 2001.

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