SECOND NATIONAL REPORT

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Please provide summary information on the process by which this report has been prepared, including information on the types of stakeholders who have been actively involved in its preparation and on material which was used as a basis for the report

The Second National Report on implementation of the provisions of the Convention on Biological Diversity (CBD) has been prepared in a frame of the grant for the "Preparation of Biodiversity Phase II Enabling Activity Project" received by Ukraine from the GEF through the World Bank (2001-2003). The objective of the project was to assist Ukraine to assess capacity building needs, identify priorities, and build consensus with respect to meeting its obligations under the CBD. Clearing House Mechanism was also established within the frames of the Project.

Collection of the necessary data and compilation of the preliminary draft report was fulfilled with the financial assistance of the Dutch side within the frames of the Joint Working Programme for Ukrainian –Netherlands Co-operation in the Field of Environment for the Period 2002-2004.

Please provide information on any particular circumstances in your country that are relevant to understanding the answers to the questions in this report

Transition from strictly centralized economy towards market-based one, processes of the transformation of political system in Ukraine influence significantly the biodiversity protection environment there. However, in spite of all the difficulties of transition period, the foundations of modern environmental policy have been practically established in Ukraine after its independence. The main principles of the state environmental policy are declared in the respective articles of the Constitution of Ukraine, a number of Ukrainian laws and program documents have been adopted since 1991.

The Law of Ukraine "On the Protection of Environment", which was adopted in 1991, laid the foundation for regulating issues in the sphere of environmental protection, environmental safety and sustainable use of natural resources. It has become a framework for the development of a series of legislative acts in this area.

Ratification of CBD by Verkhovna Rada (Parliament) of Ukraine on 29th November, 1994 ensured further development of environmental conservational activities, promoted increasing of international co-operation, involvement of Ukraine in global environmental concerns and actions.

National activities in biodiversity conservation are implemented in accordance with the existing national legal framework as well as the international conventions ratified by Ukraine and the Pan-European Biological and Landscape Diversity Strategy (1995).

The adoption of the Constitution of Ukraine on June 28, 1996 was an important step towards the improvement of environmental policy in the country. The Constitution proclaims the responsibility of the State to ensure environment safety and to maintain environment stability and equilibrium.

The Strategy of Conservation of Ukraine's Biological Diversity was approved in 1997. The main objectives of it are as follows:

- Preservation, restoration and improvement of the state of natural, semi-natural and disturbed ecosystems, habitats of individual species and components of landscapes;

- Promoting the transition to sustainable use of natural resources;

- Keeping the population ever more informed on the issues of biological diversity, as well as involving an ever greater number of people in the activity relating to the conservation of biodiversity;

- Enhancing the responsibility for preservation of biodiversity of enterprises, organizations and establishments whose activity are linked with the utilization of natural resources and affect the environment.

The development of the relevant political and legal base for successful implementation of CBD has been elaborated in many aspects. Necessary strategic documents and legal acts have been developed to reach the main goals of the Convention.

Biodiversity conservation became one of the nationwide priorities for the

governmental nature protection policy, which is reflected in the Ukrainian environmental law system. In elaboration of applicable legislation a number of new legal acts and documents governing social and economic relations within protection, utilization and restoration of wild nature were developed and adopted by the Verkhovna Rada: The Programme for Further Development of the Protected Areas in Ukraine (1994), The National Programme for the Environmental Rehabilitation of the Dnipro River Basin and the Improvement of the Quality of Drinking Water (1996), the laws "On the Animal Kingdom" (1993, 2001), "On the Plant Kingdom" (1999), "On the State Programme of Ukraine's National Environmental Network Development for Years 2000-2015" (2000), " On the Adoption of the State Programme of the Protection and Rehabilitation of the Azov-Black Seas Environment" (2001), "On the Red Book of Ukraine" (2002). Implementation of the last one will ensure the preservation and restoration of the biodiversity and national landscape diversity as well contributes essentially to developing the Pan-European Environmental Network. Law "On Accession to Cartagena Protocol" was ratified by the Verkhovna Rada (2002).

Another important draft law "National Programme for Preservation of Biodiversity Conservation is under the development now and is to be submitted to the Verkhovna Rada.

The draft National Action Plan on Biodiversity for 2002-2015 was developed to implement the Strategy.

Please indicate, by marking an "x" in the appropriate column below, the level of priority your country accords to the implementation of various articles, provisions and their associated decisions, and relevant programmes of the work of the Convention.

Articles/Provisions /Programme of Work	Level of Priorities		
	High	Medium	Low
Article 5 - Cooperation		X	
Article 6 - General measures for conservation and sustainable use	X		
Article 7 - Identification and monitoring		X	
Article 8 - In situ conservation	X		
Article 8h - Alien species		X	
Article 8j - Traditional knowledge and related provisions			X
Article 9 - Ex situ conservation		X	
Article 10 - Sustainable use of components of biological diversity	X		
Article 11 - Incentive measures	X		
Article 12 - Research and training		X	

Article 13 - Public education and awareness		X	
Article 14 - Impact assessment and minimizing adverse impacts		X	
Article 15 - Access to genetic resources			X
Article 16 - Access to and transfer of technology			X
Article 17 - Exchange of information		X	
Article 18 - Scientific and technical cooperation		X	
Article 19 - Handling of biotechnology and distribution of its benefits		X	
Article 20 - Financial resources	X		
Article 21 - Financial mechanism	X		
Agricultural biodiversity		X	
Forest biodiversity		X	
Inland water biodiversity		X	
Marine and coastal biodiversity		X	
Dryland and subhumid land biodiversity			X

Please indicate, by marking an "x" in the appropriate column below, the availability of resources required by your country for the implementation of various articles, provisions and their associated decisions, and relevant programmes of work of the Convention.

Articles/Provisions/ Programme of Work	Resources Availability			
	Good	Adequate	Limiting	Severely Limiting
Article 5 - Cooperation			X	
Article 6 -General measures for conservation and sustainable use			X	
Article 7 - Identification and monitoring			X	
Article 8 - In situ conservation			X	
Article 8h - Alien species			X	
Article 8j - Traditional knowledge and related provisions			X	
Article 9 - Ex situ conservation			X	
Article 10 - Sustainable use of components of biological diversity			X	
Article 11 - Incentive measures			X	
Article 12 - Research and training			X	
Article 13 - Public education and awareness			X	
Article 14 - Impact assessment and minimizing adverse impacts			X	
Article 15 - Access to genetic resources			X	
Article 16 - Access to and transfer of technology			X	
Article 17 - Exchange of information			X	
Article 18 - Scientific and technical cooperation			X	
Article 19 - Handling of biotechnology and			X	

distribution of its benefits				
Article 20 - Financial resources			X	
Article 21 - Financial mechanism			X	
Agricultural biodiversity			X	
Forest biodiversity		X		
Inland water biodiversity			X	
Marine and coastal biodiversity			X	
Dryland and subhumid land biodiversity			X	

The COP has established programmes of work that respond to a number of Articles.

Further comments on work programmes and priorities

the laws "On the Animal Kingdom" (1993-2001), "On the Plant Kingdom" (1999)

The Verkhovna Rada (Parliament) of Ukraine adopted a law "Principal Directions of the State Policy of Ukraine in the Field of Protection of the Environment, Use of Natural Resources and Ensuring Environment Safety" in 1998. By this law, the long-term strategy on resolving environmental tasks as well as the system of priorities in the field of environment were declared. Conservation of the biological and landscape diversity was defined as one of the State's priorities.

The aforementioned five themes of programmes of work are among main directions of biodiversity protection stressed in the Strategy of Conservation of Ukraine's Biodiversity (1997). However, it is quite complicated to ensure implementation of the above "Principal Directions..." as well as the Strategy under current financial situation and within non-effective economic system. However, the country understands its role and responsibility on biodiversity conservation and does its best to provide all necessary measures in fulfilling international obligations and responsibilities as well as pursuing proper national conservational policy.

More specifically, the set of legal instruments includes:

- **as regards inland water biodiversity**: The Water Code of Ukraine (1995), the National Programme for the Environmental Rehabilitation of the Dnipro River Basin and the Improvement of the Quality of Drinking Water (1996), the law "On the State Programme of Ukraine's National Environmental Network Development for Years 2000-2015" (2000), Ramsar Convention on Wetlands of International Importance Especially as Waterbird Habitat, which Ukraine ratified in 1996; the Helsinki Convention "On the Protection and Rational Use of Transboundary Watercources and International Lakes, ratified in 1999, the laws "On the Animal Kingdom" (1993, 2001), "On the Plant Kingdom" (1999). Ukraine ratified African-Eurasian Waterbird Agreement (AEWA)emphasizing the importance of Africa for migratory bird" (2002)and convention on "Conservation of migratory species of world animals" (Bonn Convention,1996).
- **as regards marine and coastal biodiversity**: National Programme of the Protection and Rehabilitation of the Azov-Black Seas Environment" (2001), Convention on the Protection of the Black Sea Against Pollution (1994), Convention for the Protection of Environment of the Danube Basin (2002), the law "On the State Programme of Ukraine's National Environmental Network Development for Years 2000-2015" (2000), Bern Convention – Convention of the Conservation of European wildlife and Nature Habitats ratified in 1982, Agreement on the conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area accessed in 2003;

- **as regards forest biodiversity**: The Forest Code of Ukraine (1994), the laws "On the State Programme of Ukraine's National Environmental Network Development for Years 2000-2015" (2000), "On the Animal Kingdom" (1993-2001), "On the Plant Kingdom" (1999), "On the Red Book of Ukraine" (2002).

At the species level the highest conservation priorities are assigned to species that are threatened or endangered. These are defined by way of "The Red Book of Ukraine" (the law "On the Red Book of Ukraine" (2002). Rare plan communities are defined by "The Green Book of Ukraine", which was recognized as a legal document at the beginning of 1997, following the decision of the Government. The Green Book is the unique example in the world conservational practice, since it applies to a new conceptual approach to conservation of biodiversity with the main stress on its coenotic aspect. The book provides information about 127 rare plant communities in need of conservation and protection.

Ukraine participates practically in all European processes concerning the protection and sustainable use of forests. However the lack of resources and scarce information hampers the integration of the country to the international (in particular, the pan-European) process of sustainable forest management. Today there is a poor correspondence between present day needs and long term goals concerning biodiversity conservation. There is a lack and/or poor performance of legal and financial mechanisms for preserving forest biodiversity and the new advanced environmentally friendly forest management technologies are being implemented slowly.

If applicable, please list below the articles, provisions or the programmes of work where resources are most urgently needed for implementation at the national level.

Resources are most urgently needed for implementation at the national level the following articles of the CBD:

- Article 6 - General measures for conservation and sustainable use;
- Article 11 - Incentive measures;
- Article 13 - Public education and awareness.

Further comments on priorities and resource availability

In the space below, please identify a maximum of three areas for each article, provision and programme of work listed above, in which resource availability is most limiting and urgent as far as your national circumstances are concerned.

Resource availability is most limiting and urgent for the development and implementation of:

Article 5 Cooperation

11. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	

12. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

Cooperation occurs at various levels. However it seems that the country does not have strategic vision of such cooperation. The cooperation should become more intense after the adoption of the Concept of Sustainable Development of Ukraine and of its variants for different sectors. It should be understood that these should be designed in accordance with international standards.

The shortage of available funds is the most serious obstacle to the proper execution of Ukraine's responsibilities as a Party of CBD. That is why international technical and financial aid and support for implementation of concrete projects provided by international bodies and institutions (Global Environment Facility, World Bank, UNEP, Council of Europe etc.) as well as developed countries (the Netherlands, Denmark, United Kingdom, Italy, Lichtenstein etc.) are especially important.

13. Is your country actively cooperating with other Parties in respect of areas beyond national jurisdiction for the conservation and sustainable use of biological diversity?	
bilateral cooperation (please give details below)	X
b) international programmes (please give details below)	X
c) international agreements (please give details below)	X

a) The joint working programme of Ukraine and the Netherlands in the field of environmental protection promotes the European Strategy for preservation of biological and landscape diversity, Ramsar, Bern, Bonn and Washington (CITEC) conventions for implementation in Ukraine, supports Ukraine's representation in various forums to the conventions and helps to create new and rehabilitate old nature protected areas to be integrated into the common European EcoNet; key directions of the Netherlands assistance are following:

- support of accession in and implementation of the international agreements/conventions in the field of biodiversity conservation and nature protection,
- implementation of the national wildlife conservation policy and programmes;

Ukrainian-Danish co-operation was initiated by the Ministry of Environment of Denmark by signing in 1999 the Agreement on environmental co-operation.
The co-operation was established with

- Poland in the frame of protection of cross-border wetland ecosystems of international importance in Poleski National Park (Poland) and the Shatsky pryrodny National Park;
- Russia Federation, Slovak Republic, Hungary;

Primarily concerns are also the establishment of transboundary biosphere reserves.

b) Biodiversity problems are constituent part of the international program "Management and Protection of the Black Sea" supported in part by GEF via UNDP and involving countries of the Black Sea region, including Ukraine (1993-2000); the Programme for the Environmental Rehabilitation of the Dnipro River Basin and the Improvement of the Quality of Drinking Water, Ukraine-Moldova co-operation on Environmental Rehabilitation of the Dnister River Basin (via legal agreement); the Carpathian Ecoregion Initiative, which is a unique international partnership, brings people together in Central and Eastern Europe to secure conservation and development across the seven countries of the Carpathian

mountains; Ukrainian foresters participate in the European program for preserving the genetic resources of tree species "EUFORGEN". GEF/World Bank's "Transcarpathian Biodiversity Protection", "Danube Delta Biodiversity", "Preparation of Biodiversity Phase II Enabling Activity" and "Azov-Black Sea Corridor Biodiversity Conservation" projects, IUCN project "Conservation and Wise Use of Forests in Central and Eastern Europe" and the Econet, etc.

c) Ukraine is a Party of practically all main related to biodiversity conventions, in particular: Convention on Biodiversity, Convention on Wetlands of International Importance, Especially as Waterbird Habitat, Convention on International Trade in Endangered Species of Wild Fauna and Flora, Convention on Conservation of Migratory species of Wild Animals, Convention on Conservation of European Wildlife and Natural Habitats, African-European migratory Waterbird Agreement (AEWA), the Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ACSOBANS), Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention), Agreement on the Conservation of European Population of Bats (1999).

The Agreement was signed on Cooperation between Poland, Slovakia and Ukraine in the Eastern Carpathians International Biosphere Reserve, between Romania and Ukraine on Bilateral Biosphere Reserve "Danube Delta".

Decision IV/4. Status and trends of the biological diversity of inland water ecosystems and options for conservation and sustainable use

14. Has your country developed effective cooperation for the sustainable management of transboundary watersheds, catchments, river basins and migratory species through bilateral and multilateral agreements?	
a) no	
b) yes - limited extent (please give details below)	X
c) yes - significant extent (please give details below)	
d) not applicable	

b) co-operation is realized in the frame of some particular projects dealing with water quality and management of the Dnipro river basin, Dnister river basin, West Bug river basin, in the frame of bilateral Romanian-Ukrainian biosphere reserve "Danube Delta", etc

Decision IV/15. The relationship of the CBD with the CSD and biodiversity-related conventions, other international agreements, institutions and processes or relevance

15. Has your country developed management practices for transboundary protected areas?	
a) no	
b) yes - limited extent (please give details below)	X
c) yes - significant extent (please give details below)	
d) not relevant	

At the level of conceptual statements management practices are being harmonized with neighboring countries in the west, and to a lesser extent with those in the east.

Decision V/21. Co-operation with other bodies

16. Has your country collaborated with the International Biodiversity Observation Year of DIVERSITAS, and ensured complementarity with the initiative foreseen to be undertaken by the United Nations Educational, Scientific and Cultural Organization and the Secretariat of the Convention on Biological Diversity to increase scientific knowledge and public awareness of the crucial role of biodiversity for sustainable development?	
a) no	
b) to a limited extent	X
c) to a significant extent	

Decision V/27. Contribution of the Convention on Biological Diversity to the ten-year review of progress achieved since the United Nations Conference on Environment and Development

17. *Is your country planning to highlight and emphasize biological diversity considerations in its contribution to the ten-year review of progress since the Earth Summit*?	
a) no	
b) yes	X

Further comments on implementation of this Article

A state program envisages in the coming 10 years the accomplishment of an action plan for implementing the decisions of the conferences. But there is a lack of information, so the public is poorly acquainted with the results of the Rio and Johannesburg summits.

Article 6 General measures for conservation and sustainable use

18. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High	X	b) Medium		c) Low	

19. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

There is a need to enhance the knowledge and skills of the management authorities, especially at the level of oblasts (provinces) and regions (districts), in principles of sustainable use of natural resources. There also should be a mechanism that would make the decision process transparent to the public.

20. What is the status of your national biodiversity strategy (6a)?	
a) none	
b) early stages of development	
c) advanced stages of development	
d) completed	
e) completed and adopted	X (see comments below)

f) reports on implementation available	X (in a frame of a few CBD's articles)
21. What is the status of your national biodiversity action plan (6a)?	
a) none	
b) early stages of development	
c) advanced stages of development	X (see comments below)
d) completed2	
e) completed and adopted2	
f) reports on implementation available	
22. Do your national strategies and action plans cover all articles of the Convention (6a)?	
a) some articles only	
b) most articles	X
c) all articles	
23. Do your national strategies and action plans cover integration of other sectoral activities (6b)?	
a) no	
b) some sectors	X
c) all major sectors	
d) all sectors	

Ukraine received the GEF's grant for "Preparation of Biodiversity Strategy/Action Plan" Project in 1996. The objective of that first phase Enabling Activity on Biodiversity was to formulate the strategies and actions necessary for the protection and sustainable use of Ukraine's biodiversity in accordance with articles of the Convention on Biological Diversity, and to prepare a plan for their implementation. The primary products were the Biodiversity Strategy and Action Plan (BSAP) and the first National Report of Ukraine on Conservation of Biological Diversity to the Conference of the Parties.

The project outcomes improved Ukraine's ability to promote biodiversity conservation within and outside protected areas, the regulation of its uses and unified the various conservation initiatives being pursued. During and after the project completions, Ukrainian conservation priorities were refined and a greater awareness of the issues and national efforts was realized among governmental and non-governmental groups. The phase I enabling activity lead to adoption of four biodiversity conservation initiatives: (i) the Strategy of Conservation of Ukraine's Biological Diversity – approved by Cabinet of Ministers' Regulation # 439 dated May 12, 1997; (ii) the first National Report of Ukraine on Conservation of Biological Diversity (the state of biodiversity,1997); (iii) the draft National Program of Conservation of Ukraine's Biodiversity – prepared in cooperation between relevant government ministries/agencies, approved by the Cabinet of Ministers and submitted to Parliament. Elements of this program were incorporated as priority actions into the Program on Forming of the National Ecological Network; and (iv) the "Law On the Plant Kingdom" and the Law "On the Program of Forming the National Ecological Network in Ukraine for 2000-2015".

Ukraine received the grant from the GEF through the IBRD for the "Preparation of Biodiversity Phase II Enabling Activity" Project. The objective of the phase II biodiversity enabling activity was to assist Ukraine to assess capacity building needs, identify priorities, and build consensus with respect to meeting its obligations under the CBD. The project would also establish a Clearing House Mechanism and facilitate the consultative process for preparing the second national report to

the CBD.

Currently Ukraine has prepared the second National Report on Biodiversity and is in a state of updating the existing National Biodiversity Strategy and consideration of valuable changes in national legislation. The updated National Programme on Biodiversity is now in the process of preparation and will be submitted to the Verkhovna Rada (Parliament) of Ukraine.

The Concept of the Protection and Rehabilitation of the Environment of the Azov and Black Seas was adopted in 1998. The State Program of Ukraine's national Network Development for Years 2000-2015 was adopted in 2000, State Program of Protection and Rehabilitation of Azov-Black Sea Environment" (2001).

Decision II/7 and Decision III/9 Consideration of Articles 6 and 8

24. Is action being taken to exchange information and share experience on the national action planning process with other Contracting Parties?	
a) little or no action	
b) sharing of strategies, plans and/or case-studies	X
c) regional meetings	
25. Do all of your country's strategies and action plans include an international cooperation component?	
a) no	
b) yes	X
26. Are your country's strategies and action plans coordinated with those of neighbouring countries?	
a) no	
b) bilateral/multilateral discussions under way	
c) coordinated in some areas/themes	X
d) fully coordinated	
e) not applicable	
27. Has your country set measurable targets within its strategies and action plans?	
a) no	
b) early stages of development	
c) advanced stages of development	X
d) programme in place	
e) reports on implementation available	
If a developing country Party or a Party with economy in transition - 28. Has your country received support from the financial mechanism for the preparation of its national strategy and action plan?	
a) no	
b) yes	X
If yes, which was the Implementing Agency (UNDP/UNEP/World Bank)?	World Bank

Decisions III/21. Relationship of the Convention with the CSD and biodiversity-related conventions

29. Are the national focal points for the CBD and the competent authorities of the Ramsar Convention, Bonn Convention and CITES cooperating in the implementation of these conventions to avoid duplication?

a) no	
b) yes – limited extent	X
c) yes – significant extent	

Article 7 Identification and monitoring

30. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High	X	b) Medium		c) Low	

31. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources
Monitoring surveys and scientific observations of species' populations are currently reduced to a minimum. Legal provisions exist for monitoring and surveying of species, but because of the lack of financial resources even species of economic value (game and fish) as well as endangered species are hardly monitored.

32. Does your country have an ongoing inventory programme at species level (7a)?	
a) minimal activity	
b) for key groups (such as threatened or endemic species) or indicators	
c) for a range of major groups	X
d) for a comprehensive range of species	
33. Does your country have an ongoing inventory programme at ecosystem level (7a)?	
a) minimal activity	
b) for ecosystems of particular interest only	
c) for major ecosystems	X
d) for a comprehensive range of ecosystems	
34. Does your country have an ongoing inventory programme at genetic level (7a)?	
a) minimal activity	X
b) minor programme in some sectors	
c) major programme in some sectors	
d) major programme in all relevant sectors	
35. Does your country have ongoing monitoring programmes at species level (7a)?	
a) minimal activity	
b) for key groups (such as threatened or endemic species) or indicators	X
c) for a range of major groups	
d) for a comprehensive range of species	

36. Does your country have ongoing monitoring programmes at ecosystem level (7b)?	
a) minimal activity	

b) for ecosystems of particular interest only	X
c) for major ecosystems	
d) for a comprehensive range of ecosystems	
37. Does your country have ongoing monitoring programmes at genetic level (7b)?	
a) minimal activity	X
b) minor programme in some sectors	
c) major programme in some sectors	
d) major programme in all relevant sectors	
38. Has your country identified activities with adverse affects on biodiversity (7c)?	
a) limited understanding	
b) threats well known in some areas, not in others	
c) most threats known, some gaps in knowledge	X
d) comprehensive understanding	
e) reports available	
39. Is your country monitoring these activities and their effects (7c)?	
a) no	
b) early stages of programme development	X
c) advanced stages of programme development	
d) programme in place	
e) reports on implementation available	
40. Does your country coordinate information collection and management at the national level (7d)?	
a) no	
b) early stages of programme development	X
c) advanced stages of programme development	
d) programme in place	
e) reports on implementation available	

Decision III/10 Identification, monitoring and assessment

41. Has your country identified national indicators of biodiversity?	
a) no	
b) assessment of potential indicators underway	X
c) indicators identified (if so, please describe below)	

42. Is your country using rapid assessment and remote sensing techniques?	
a) no	
b) assessing opportunities	
c) yes, to a limited extent	X
d) yes, to a major extent	
e) reports on implementation available	
43. Has your country adopted a "step-by-step" approach to implementing Article 7 with initial emphasis on identification of biodiversity components (7a) and activities having adverse effects on them (7c)?	
a) no	X
b) not appropriate to national circumstances	
c) yes	
44. Is your country cooperating with other Contracting Parties on pilot projects to demonstrate the use of assessment and indicator methodologies?	
a) no	
b) yes (if so give details below)	X
45. Has your country prepared any reports of experience with application of assessment methodologies and made these available to other Contracting Parties?	
a) no	X
b) yes	
46. Is your country seeking to make taxonomic information held in its collections more widely available?	
a) no relevant collections	
b) no action	
c) yes (if so, please give details below)	X

32. There is no state-approved ongoing inventory program at species level, except the State Cadastres [Inventories] of Plants and Animals. However, these programs are in fact pilot programs, which are limited in their scope. Moreover, the mentioned State Inventories do not stipulate any substantial financial and/or institutional support for taxonomic research, field inventories, and other aspects needed at the species level. Inventories at the species level are usually performed for some groups at research institutions, with no support or with occasional support from governmental agencies.

35. Ukraine has ongoing monitoring programs at species level only for some key groups, but there is very limited coordination of such monitoring efforts, and almost no governmental support for the nation-wide monitoring of key species. Some monitoring programs are performed by research institutions.

44. The cooperation is realized in a frame of the International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forest, operating under UN/ECE, ICP Forest. The Laboratory of forests monitoring and certification of the Ukrainian Scientific Research Institute of Forestry and Forest Melioration (Kharkiv city) represents the Ukrainian National Coordination Centre of ICP Forests and participate in test phase of ICP Forests on development of indicators and evaluation

methodology of biodiversity at forest monitoring sites.

46. There are no concerted national actions aimed at making taxonomic information held in national biological collections more widely available. Data on Ukraine's biological collections are mostly unavailable in electronic format; there are very few taxonomic collections databases available online. However, taxonomic publications, collection catalogs, scientific monographs, floristic and faunistic inventories and checklists (based on national collections) that resulted from research activities of various institutions are available for major taxonomic groups of organisms (vascular plants, bryophytes, algae, fungi and fungi-like organisms, vertebrates and invertebrates). Ukraine has to bring these rather independent activities to the level of a coordinated national program.

Decision V/7. Identification, monitoring and assessment, and indicators

47. Is your country actively involved in co-operating with other countries in your region in the field of indicators, monitoring and assessment?	
a) no	
b) limited co-operation	X
c) extensive co-operation on some issues	
d) extensive co-operation on a wide range of issues	
48. Has your country made available case studies concerning the development and implementation of assessment, monitoring and indicator programmes?	
a) no	X
b) yes - sent to the Secretariat	
c) yes – through the national CHM	
d) yes – other means (please specify)	
49. Is your country assisting other Parties to increase their capacity to develop indicator and monitoring programmes?	
a) no	
b) providing training	
c) providing direct support	
d) sharing experience	
e) other (please describe)	X

Further comments on implementation of this Article

49. The normative-legal base for environmental monitoring has been developed in Ukraine. By the relevant Decree of the Cabinet of Ministers, the Statute of the State System of Environmental Monitoring, which includes aspect of biodiversity, was approved in 1993 and updated in 1998. The legal base for biological objects' monitoring also includes laws of Ukraine "On the Animal Kingdom" (Article 50, "Monitoring of the Animal Kingdom") and "On the Plant Kingdom" (Article 39, "Monitoring of the Plant Kingdom"). This aspect of the State monitoring is covered by the Ministry of the Environment and Natural Resources (terrestrial and marine ecosystems), Ministry of Forestry (forests and game animals), Ministry of the Agricultural Policy (agricultural lands).

According to the Law of Ukraine "On Nature Conservation Fund of Ukraine" (Article 43), the main document reflecting results of observations on the state and changes of natural complexes of protected territories as well as their biodiversity are Chronicles of Nature. Its materials are used for estimation of the state of biodiversity conservation in nature reserve objects and definition of ways of its improving.

Monitoring of waterfowl species spending winters in coastal territories and aquatories of the Black Sea and Azov Sea is performed every year in accordance with the

international program for monitoring of wild water birds. Improvement of the existing legal-regulative base of the State monitoring system is in process. By present time the Ministry of the Environment and Natural Resources has developed methodological foundations for preparation of State programmes in the field of environment monitoring. Ukraine participates in development of agrobiodiversity indicators that may be used by other Parties of CBD.

Decisions on Taxonomy

Decision IV/1 Report and recommendations of the third meeting of SBSTTA [part]

50. Has your country carried out a national taxonomic needs assessment, and/or held workshops to determine national taxonomic priorities?	
a) no	
b) early stages of assessment	X
c) advanced stages of assessment	
d) assessment completed	
51. Has your country developed a national taxonomic action plan?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) action plan in place	
e) reports on implementation available	
52. Is your country making available appropriate resources to enhance the availability of taxonomic information?	
a) no	
b) yes, but this does not cover all known needs adequately	X
c) yes, covering all known needs	
53. Is your country encouraging bilateral and multilateral training and employment opportunities for taxonomists, particularly those dealing with poorly known organisms?	
a) no	
b) some opportunities	X
c) significant opportunities	
54. Is your country investing on a long-term basis in the development of appropriate infrastructure for your national taxonomic collections?	
a) no	
b) some investment	X
c) significant investment	
55. Is your country encouraging partnerships between taxonomic institutions in developed and developing countries?	
a) no	X
b) yes – stated policy	
c) yes – systematic national programme	
56. Has your country adopted any international agreed levels of collection housing?	

a) no	
b) under review	
c) being implemented by some collections	X
d) being implemented by all major collections	

The National Centre of Genetic Resources existing with Institute of Genetic and Selection by V.Yuriev of the Ukrainian Agrarian Academy of Science has a collection of seeds. The collection consists of 22 600 samples.

57. Has your country provided training programmes in taxonomy?	
a) no	
b) some	X
c) many	
58. Has your country reported on measures adopted to strengthen national capacity in taxonomy, to designate national reference centres, and to make information housed in collections available to countries of origin?	
a) no	
b) yes – in the previous national report	
c) yes – via the clearing-house mechanism	
d) yes – other means (please give details below)	X
59. Has your country taken steps to ensure that institutions responsible for biological diversity inventories and taxonomic activities are financially and administratively stable?	
a) no	
b) under review	X
c) yes for some institutions	
d) yes for all major institutions	
60. Has your country assisted taxonomic institutions to establish consortia to conduct regional projects?	
a) no	
b) under review	
c) yes – limited extent	X
d) yes – significant extent	
61. Has your country given special attention to international funding of fellowships for specialist training abroad or for attracting international experts to national or regional courses?	
a) no	X
b) under review	
c) yes – limited extent	
c) yes – significant extent	
62. Has your country provided programmes for re-training of qualified professionals moving into taxonomy-related fields?	
a) no	X
b) some	
c) many	

Decision V/9. Global Taxonomy Initiative: Implementation and further advance of the Suggestions for Action

63. Has your country identified its information requirements in the area of taxonomy, and assessed its national capacity to meet these requirements?	
a) no	X
b) basic assessment	
c) thorough assessment	
64. Has your country established or consolidated taxonomic reference centres?	
a) no	X
b) yes	
65. Has your country worked to increase its capacity in the area of taxonomic research?	
a) no	X
b) yes	
66. Has your country communicated information on programmes, projects and initiatives for consideration as pilot projects under the Global Taxonomy Initiative to the Executive Secretary?	
a) no	X
b) yes	
67. Has your country designated a national Global Taxonomy Initiative focal point linked to other national focal points?	
a) no	X
b) yes	
68. Has your country participated in the development of regional networks to facilitate information-sharing for the Global Taxonomy Initiative?	
a) no	X
b) yes	
If a developing country Party or Party with economy in transition - 69. Has your country sought resources through the financial mechanism for the priority actions identified in the decision?	
a) no	X
b) applied for unsuccessfully	
c) applied for successfully	

Further comments on implementation of these decisions

50. Ukraine has not carried out a national taxonomic needs assessment. In fact, the national attention to taxonomic needs is rather low despite old traditions and considerable taxonomic achievements of Ukrainian taxonomists. Almost all major groups of organisms are were covered by taxonomic studies, which resulted in such publications as multivolume series *Flora of Ukraine* (vascular plants), *Fauna of Ukraine*, "floras", monographs and identification manuals on various groups of algae, fungi, protists, animals, etc.

There were no nation-wide workshops for determining national taxonomic priorities. The taxonomic research priorities are usually determined by research institutions and individual researchers on the case-by-case basis, or with a limited coordination, but there is evidently a lack of concerted taxonomic actions. The important task for the near future would be to organize priority-setting workshops for taxonomy in Ukraine.

51. No national taxonomic action plan has been developed in Ukraine. Development of this plan should be the next step after the priority-setting phase. The taxonomic action plan shall include capacity-building for taxonomy in Ukraine (including training and education of taxonomists, strengthening taxonomic research institutions, adequate governmental support). The action plan should be developed with crucial participation of research institutions of the National Academy of Sciences of Ukraine, universities, the Ministry of Environment and Natural Resources of Ukraine, and all other stakeholders. The implementation of the action plan has to be backed by adequate financial and technical support from the government and non-governmental funding agencies at the national and international levels.

52. Ukraine makes available appropriate resources to enhance the availability of taxonomic information, but this does not cover all known needs adequately. Only limited resources are available. The availability of taxonomic information has to be enhanced, in particular, through making this information available in an electronic format. The existing taxonomic databases in Ukraine are few, and they are usually not united or coordinated at the national scale.

53. Bilateral and multilateral training and employment opportunities for taxonomists (particularly those dealing with poorly known organisms) are usually not encouraged directly by the state. Such cooperation is usually based on direct contacts between individual researchers and/or institutions with their partners in other countries. There are no concerted national activities in that respect.

54. Ukraine made some limited investments on a long-term basis in the development of appropriate infrastructure for national taxonomic collections. Some collections were approved as "National Heritage" collections (for example, the National Herbarium of the Kholodny Institute of Botany with about 2 million plant specimens, collections of the National Natural History Museum in Kyiv, and some other institutions). However, the support provided by the government is very limited and does not cover even basic needs for preservation, maintenance, curation and growth of collections. In most cases biological collections (even those of national and international importance) are housed in old or unsuitable buildings or storage facilities with no controlled environment conditions (pest control, humidity, temperature, etc.); they usually have inadequate staff and limited resources. In order to improve the situation, Ukraine has to develop a national program (or action plan) for salvation, preservation, improvement and taxonomic use of unique biological collections.

56. Ukraine has not adopted any international agreed levels of collection housing. Please see question 54.

57. Ukraine provided (and provides) some training programs in taxonomy. Taxonomists are trained, to a limited extent, at universities and research institutions (including postgraduate and postdoctoral programs). However, such training programs in taxonomy are in fact available only at several largest institutions.

58. Ukraine has not reported on measures adopted to strengthen national capacity in taxonomy, to designate national reference centers, and to make information housed in collections available to countries of origin. No official reference centers have been designated so far.

59. Ukraine has taken some limited steps to ensure that institutions responsible for biological diversity inventories and taxonomic activities are financially and administratively stable, but these efforts (basic budget support) have been very limited both in their scope and resources. Most of these institutions rely on governmental budget funding, which is grossly inadequate for financial stability. The

grant system in Ukraine, at least for taxonomy, is in its embryonic state, and Ukraine's taxonomy can rely on additional support only from international funding institutions for studying biodiversity of the country. The solution could be achieved through an elaborate and realistic national taxonomic strategy and action plan developed in coordination with the goals and tasks of the Global Taxonomy Initiative.

61. There was no special attention of the State to international funding of fellowships for specialist training abroad or for attracting international experts to national or regional courses. Such activities are usually initiated by individual researchers and/or institutions directly. Please, see also question 53.

62. Ukraine has not provided any programs for re-training of qualified professionals moving into taxonomy-related fields, because professionals usually move in the opposite direction (from taxonomy-related fields to more "respectable" fields of biology), or leave science for other employment opportunities. Re-training for taxonomy, when it occurs, is usually performed on the case-by-case basis at employing institutions.

63. There was only a basic assessment and identification of Ukraine's information requirements in the area of taxonomy.

64. Ukraine has not established or consolidated taxonomic reference centers. However, these centers can be easily selected on the taxonomic and regional basis (regional taxonomic reference centers in administrative units of Ukraine, and national taxonomic reference centers, main research institutions and their collections; for example, Kholodny Institute of Botany for plants and fungi, Schmalhausen Institute of Zoology for animals, probably Kovalevskiy Institute of the Southern Seas for marine organisms, Gryshko National Botanical Garden for living collections of cultivated plants etc.).

65. There were no national (governmental) actions aimed at improving the national capacity in the area of taxonomic research. Such actions can be planned within the framework of the national taxonomic action plan.

66. Ukraine has not yet communicated information on programs, projects and initiatives for consideration as pilot projects under the Global Taxonomy Initiative to the Executive Secretary.

67. Ukraine has not designated officially a national Global Taxonomy Initiative focal point linked to other national focal points.

Further comments on implementation of this Article

Due to a lack of financial resources the work under this article has not been incorporated within a single national programmes or action plans and made at the needed level.

Article 8 In situ conservation [excluding Articles 8h]

70. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High	X	b) Medium		c) Low	

71. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate	X	c) Limiting		d) Severely limiting	

Further comments on relative priority and on availability of resources

The legal base for biodiversity conservation in-situ are set out in the Laws of Ukraine "On the Protection of Environment" (1991) with later amendments in 2000, "On the Natural Reserve Fund of Ukraine" (1992) with later amendments in 1999, "On the State Program of Ukraine's National Environmental Network Development for Years 2000-2015" (2000), "On the Red Book of Ukraine" (2002). In order to expand areas of protected territories, optimize the conservational network, improve its management and prevent privatization of valuable natural objects and territories, the Program of Prospective Development of Protected Areas in Ukraine has been adopted and the Presidential Decree "On reserving valuable natural territories for subsequent conservation" has been issued in 1994.

72. Has your country established a system of protected areas which aims to conserve biological diversity (8a)?	
a) system under development	
b) national review of protected areas coverage available	
c) national protected area systems plan in place	
d) relatively complete system in place	X

73. Are there nationally adopted guidelines for the selection, establishment and management of protected areas (8b)?	
a) no	
b) no, under development	
c) yes	
d) yes, undergoing review and extension	X

74. Does your country regulate or manage biological resources important for the conservation of biological diversity with a view to ensuring their conservation and sustainable use (8c)?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) programme or policy in place	
e) reports on implementation available	

75. Has your country undertaken measures that promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings (8d)?	
a) no measures	
b) some measures in place	X

c) potential measures under review	
d) reasonably comprehensive measures in place	
76. Has your country undertaken measures that promote environmentally sound and sustainable development in areas adjacent to protected areas (8e)?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) reasonably comprehensive measures in place	
77. Has your country undertaken measures to rehabilitate and restore degraded ecosystems (8f)?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
78. Has your country undertaken measures to promote the recovery of threatened species (8f)?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
79. Has your country undertaken measures to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology (8g)?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
80. Has your country made attempts to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and sustainable use of its components (8i)?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) programme or policy in place	
e) reports on implementation available	
81. Has your country developed and maintained the necessary legislation and/or other regulatory provisions for the protection of threatened species and populations (8k)?	
a) no	
b) early stages of development	
c) advanced stages of development	
d) legislation or other measures in place	X
82. Does your country regulate or manage processes and categories of activities identified under Article 7 as having significant adverse effects on biological diversity (8l)?	

a) no	
b) under review	
c) yes, to a limited extent	X
d) yes, to a significant extent	

If a developed country Party -

83. Does your country cooperate in providing financial and other support for *in- situ* conservation particularly to developing countries (8m)?

If a developing country Party or Party with economy in transition -

84. Does your country receive financial and other support for *in situ* conservation (8m)?

a) no	
b) yes (if so, please give details below)	X (see above)

Decision II/7 Consideration of Articles 6 and 8 of the Convention

85. Is action being taken to share information and experience on implementation of this Article with other Contracting Parties?	
a) little or no action	
b) sharing of written materials and/or case-studies	X
c) regional meetings	X

Further comments on implementation of this Article

Development of nature reserves, creation of new protected objects is the practical implementation of environmental policy of the state in respect of preservation of biodiversity, unique and typical landscapes. The Nature Protected Area Fund of Ukraine includes more than 6808 territories and objects with the total area of 2.4 mln ha, which makes about 4. 0% of the territory of Ukraine. For the period starting from 1992 the Fund has increased nearly twice, mainly at the expense of relatively new categories – biosphere reserves, national nature and regional landscape parks.

In addition to the territories and objects of the Nature Protected Area Fund, 22 wetlands of international significance ("Ramsar sites") also belong to the territories, which are subjected to special protection in Ukraine. Having taken into account a great importance of wetlands ecosystems in maintenance of ecological equilibrium, works on inventorying wetlands and forming the inventory list of wetlands of the national important were started. In 1999 Resolution of the Cabinet of Ministers of Ukraine "Provisions on National wetlands" was approved. The Resolution determined the single criteria of evaluation of the territories and a procedure for acknowledging them as wetlands of national important, conditions of their protection and management.

Territories and objects of the Nature Protected Area Fund of Ukraine should become elements of the National ecological network of Ukraine, the development of which started in 1999.

In the sphere of international activity works on creation of interstate protected areas went on. In 1999 there was completed the GEF/World Bank "Danube Delta Biodiversity Project" (started in 1994) and resulted in creation of the Danube biosphere reserve. Ukraine received diplomas of UNESCO for the creation of Danube biosphere reserve, which is a part of the transboundary Romanian-Ukrainian biosphere reserve "Danube Delta" and trilateral Polish-Slovakian-Ukrainian biosphere reserve 'Eastern Carpathians" in 1999.

In 2003 the GEF/World Bank Azov-Black Sea Biodiversity Conservation Project became effective. The project objective is to conserve coastal biodiversity within the Azov-Black Sea coastal corridor by strengthening the protected area network and to mainstreaming biodiversity conservation into the agricultural landscapes which connect them.

Under the Bern Convention the preparation of proposals on inclusion of the Ukrainian

protected territories into the Emerald Ecological Network was carried out.

Particular directions of actions *in-situ* conservation are also been undertaken in the frame of Government support, certain projects that are being supported by some other international organizations and state institutions.

Article 8h Alien species

86. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High	X (forest ecosystem)	b) Medium	X (Animals, Plants)	c) Low	

87. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

Special programs to reduce negative impact of alien species have been not developed.

Preliminary assessment of alien species composition to evaluate possible negative consequences of its expansion was made by scientific institutions (National Academy of Sciences). So far expansion of alien species is considered as the most dangerous for biodiversity after habitats destruction. The flora of Ukraine numbered about 830 alien species. Among them 100 ones are quite aggressive and 24 ones are actively introducing.

The issue of the impact of alien species in the continental waters of Ukraine, has been studied only for a number of the Far East fishes brought from the river Amur and its tributaries (such as *Ctenopharyngodon idella*, *Hypophthalmichthys molitrix*). At the same time there are no scientifically-technical programs with the attraction of scientists-hydrobiologists, hydroecologists, ichthyologists to assess the alien species' impact on the continental water ecosystems and their biodiversity.

88. Has your country identified alien species introduced?	
a) no	
b) only major species of concern	X + including new and recent introductions
c) only new or recent introductions	
d) a comprehensive system tracks new introductions	
e) a comprehensive system tracks all known introductions	

89. Has your country assessed the risks posed to ecosystems, habitats or species by the introduction of these alien species?	
a) no	
b) only some alien species of concern have been assessed	X
c) most alien species have been assessed	

90. Has your country undertaken measures to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species?	
a) no measures	
b) some measures in place	X with further potential measures under review
c) potential measures under review	
d) comprehensive measures in place	

Decision IV/1 Report and recommendations of the third meeting of SBSTTA

91. Is your country collaborating in the development of projects at national, regional, sub-regional and international levels to address the issue of alien species?	
a) little or no action	
b) discussion on potential projects under way	
c) active development of new projects	X
92. Does your national strategy and action plan address the issue of alien species?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	

Decision V/8. Alien species that threaten ecosystems, habitats or species

93. Is your country applying the interim guiding principles for prevention, introduction and mitigation of impacts of alien species in the context of activities aimed at implementing article 8(h) of the Convention, and in the various sectors?	
a) no	
b) under consideration	
c) limited implementation in some sectors	X
d) extensive implementation in some sectors	
e) extensive implementation in most sectors	
94. Has your country submitted case-studies to the Executive Secretary focusing on thematic assessments?	
a) no	X
b) in preparation	
c) yes	
95. Has your country submitted written comments on the interim guiding principles to the Executive Secretary?	
a) no	X
b) yes	
96. Has your country given priority to the development and implementation of alien invasive species strategies and action plans?	
a) no	X (Plants)
b) yes	X (Forest ecosystem)
97. In dealing with the issue of invasive species, has your country developed or involved itself in mechanisms for international co-operation, including the exchange of best practices?	
a) no	
b) trans-boundary co-operation	
c) regional co-operation	X
d) multilateral co-operation	
98. Is your country giving priority attention to geographically and evolutionarily isolated ecosystems in its work on alien invasive species?	

a) no	X (Plants)
b) yes	X (Forest ecosystem)
99. Is your country using the ecosystem approach and precautionary and bio-geographical approaches as appropriate in its work on alien invasive species?	
a) no	
b) yes	X
100. Has your country developed effective education, training and public-awareness measures concerning the issue of alien species?	
a) no	
b) some initiatives	X
c) many initiatives	
101. Is your country making available the information which it holds on alien species through the CHM?	
a) no	
b) some information	X
c) all available information	
d) information available through other channels (please specify)	
102. Is your country providing support to enable the Global Invasive Species Programme to fulfil the tasks outlined in the decision and its annexes?	
a) no	X (Plants)
b) limited support	X (Forest ecosystem)
c) substantial support	

Article 8j Traditional knowledge and related provisions

103. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium		c) Low	X

104. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting		d) Severely limiting	X

Further comments on relative priority and on availability of resources

Historically, nature use in Ukraine was strongly linked with natural landscape and local natural biological resources. The main traditional forms of nature use were agriculture, horticulture, cattle breeding, hay-making, fisheries and partly hunting, wood processing, and gathering of medical herbs, mushrooms, berries, and wild honey, etc. Nature and natural symbols have deep roots with spirituality of Ukrainians. Many species of plant and animals are sacral symbols of Ukrainian folklore and culture. Ukrainian people feel very strong spiritual connection with the natural environment and all leaving beings.

From the ancient times the Ukrainians had developed efficient methods for crops rotation and support of soil fertility, multiple uses of forest resources, etc.
However Social perturbations during the time of totalitarian system of the Former Soviet regime (1917 – 1991) changed situation drastically.
After the year 1991 when Ukraine became an independent state, the Ukrainian policy has been aimed at solving of a double task: first, rehabilitation of traditional knowledge, innovation and practices of local communities as a part of the National renaissance and, second, conservation and sustainable use of biodiversity. Ratification of the CBD links these two tasks.
Carriers of traditional knowledge and traditional lifestyles in Ukraine can be identified as local communities in the regions less affected by economic activities and industry (territories within and/or around National Nature parks and Nature reserves; regions of Polissia, the Carpathians, Podillia, and some others) and local minorities. This is why the term "local knowledge" is more acceptable for Ukraine.

The priorities for Ukraine can be ranked in the following way:

- scientific research on relationships between traditional knowledge and lifestyles with use of bio-resources and biodiversity conservation;

- strengthening of local communities, their involvement in the process of decision making;

- information and education;

- development of cooperation between administration of National Nature Parks and Nature Reserves and local communities for biodiversity conservation and sustainable use;

- introduction of objectives of preservation of traditional lifestyles and local knowledge, as well as biodiversity conservation and sustainable use into other national and regional programmes ("Local Agendas 21", National Program of Ecological Network Development, etc.).

Available resources are as follows: policy willingness, scientific backgrounds, basic legal system.

Constrains: lack of experience and financial resources.

105. Has your country undertaken measures to ensure that the knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity are respected, preserved and maintained?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	

106. Is your country working to encourage the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices?	
a) no	X
b) early stages of development	
c) advanced stages of development	
d) programme or policy in place	

Existing system of environmental legislation already takes into account interest of local communities (the Law if Ukraine on Nature Reserve Fund, the Law of Ukraine on Local Authority). However there is still a gap between norms and criteria proclaimed by law and practical implications of these norms. Existing legislation is not targeted.

Additional measures aimed in a more specific way at preservation of traditional knowledge, innovations and practices of local communities are under consideration and will be assessed politically and legally.

Decision III/4 and Decision IV/9. Implementation of Article 8(j)

107. Has your country developed national legislation and corresponding strategies for the implementation of Article 8(j)?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) legislation or other measures in place	

Ukraine has no specific *(sui generis)* law to protect traditional biodiversity related knowledge. But existing legal system provides some opportunities for the implementation of Article 8j. Additional legal and non-legal measures and instruments are under consideration

108. Has your country supplied information on the implementation of Article 8(j) to other Contracting Parties through media such as the national report?	
a) no	X
b) yes - previous national report	
c) yes - CHM	
d) yes - other means (please give details below)	
109. Has your country submitted case-studies to the Executive Secretary on measures taken to develop and implement the Convention's provisions relating to indigenous and local communities?	
a) no	X
b) yes	
110. Is your country participating in appropriate working groups and meetings?	
a) none	
b) some	X
c) all	
111. Is your country facilitating the active participation of representatives of indigenous and local communities in these working groups and meetings?	
a) no	X
b) yes	

Decision V/16. Article 8(j) and related provisions

112. Has your country reviewed the programme of work specified in the annex to the decision, and identified how to implement those tasks appropriate to national circumstances?	
a) no	
b) under review	X
c) yes (please provide details)	
113. Is your country integrating such tasks into its ongoing programmes, taking into account the identified collaboration opportunities?	
a) no	
b) not appropriate to national circumstances	
c) yes – to a limited extent	X
d) yes – to a significant extent	
114. Is your country taking full account of existing instruments, guidelines, codes and other relevant activities in the implementation of the programme of work?	
a) no	
b) not appropriate to national circumstances	
c) yes – to a limited extent	X
d) yes – to a significant extent	

115. Has your country provided appropriate financial support for the implementation of the programme of work?	
a) no	X
b) not appropriate to national circumstances	
c) yes – to a limited extent	
d) yes – to a significant extent	
116. Has your country fully incorporated women and women's organizations in the activities undertaken to implement the programme of work contained in the annex to the decision and other relevant activities under the Convention?	
a) no	
b) yes	X
117. Has your country taken measures to facilitate the full and effective participation of indigenous and local communities in the implementation of the Convention?	
a) no	
b) not appropriate to national circumstances	
c) yes – to a limited extent	X
d) yes – to a significant extent	
118. Has your country provided case studies on methods and approaches concerning the preservation and sharing of traditional knowledge, and the control of that information by indigenous and local communities?	
a) no	X
b) not relevant	
c) yes – sent to the Secretariat	

d) yes – through the national CHM	
e) yes – available through other means (please specify)	
119. Does your country exchange information and share experiences regarding national legislation and other measures for the protection of the knowledge, innovations and practices of indigenous and local communities?	
a) no	X
b) not relevant	
c) yes – through the CHM	
d) yes – with specific countries	
e) yes – available through other means (please specify)	
120. Has your country taken measures to promote the conservation and maintenance of knowledge, innovations, and practices of indigenous and local communities?	
a) no	
b) not relevant	
c) some measures	X
d) extensive measures	
121. Has your country supported the development of registers of traditional knowledge, innovations and practices of indigenous and local communities, in collaboration with these communities?	
a) no	X
b) not relevant	
c) development in progress	
d) register fully developed	
122. Have representatives of indigenous and local community organizations participated in your official delegation to meetings held under the Convention on Biological Diversity?	
a) not relevant	
b) not appropriate	X
c) yes	
123. Is your country assisting the Secretariat to fully utilize the clearing-house mechanism to co-operate closely with indigenous and local communities to explore ways that enable them to make informed decisions concerning release of their traditional knowledge?	
a) no	X
b) awaiting information on how to proceed	
c) yes	
124. Has your country identified resources for funding the activities identified in the decision?	
a) no	
b) not relevant	
c) partly	X
d) fully	

Further comments on implementation of this Article

In Ukraine women and women's organizations have equal rights and opportunities to

participate in biodiversity conservation and sustainable use.

Currently the existing system of Ukrainian legislation does not refer to the notions "traditional ecological knowledge" or/and "local knowledge", "traditional nature/biodiversity use", etc. Consequently there are no direct legal instruments for protection of traditional/local knowledge with regards to the goals and objectives of the Article 8j of the CBD.

However it is not reasonable to develop *sui generis* legislation for protection of traditional biodiversity related knowledge. Instead the model of 'soft legislation' is more relevant to the current conditions in Ukraine.

Article 9 Ex situ conservation

125. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	

126. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

Certain scientific institutions are operating in this field alone. There is no state wide program or plans for biodiversity conservation and sustainable use where the role of *ex-situ* preservation would be outlined and coordinated.There are no special funds for this purpose in the country.

Ex-situ conservation has a long tradition in Ukraine, but the difficulties of a period of transition in the country have not allowed for the designation of funding for it in line with needs.

127. Has your country adopted measures for the *ex situ* conservation of components of biological diversity *native* to your country (9a)?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
128. Has your country adopted measures for the *ex situ* conservation of components of biological diversity *originating outside* your country (9a)?	
a) no measures	
b) some measures in place	
c) potential measures under review	X
d) comprehensive measures in place	
129. If the answer to the previous question was yes, is this being done in active collaboration with organizations in the other countries (9a)?	
a) no	
b) yes	X
130. Has your country established and maintained facilities for the *ex situ* conservation of and research on plants, animals and micro-organisms that represent genetic resources *native* to your country (9b)?	
a) no	

b) yes – limited extent	X
c) yes – significant extent	
131. Has your country established and maintained facilities for the *ex situ* conservation of and research on plants, animals and micro-organisms that represent genetic resources *originating elsewhere* (9b)?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
132. If the answer to the previous question was yes, is this being done in active collaboration with organizations in the other countries (9a)?	
a) no	
b) yes	X
133. Has your country adopted measures for the reintroduction of threatened species into their natural habitats under appropriate conditions (9c)?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
134. Has your country taken measures to regulate and manage the collection of biological resources from natural habitats for *ex situ* conservation purposes so as not to threaten ecosystems and *in situ* populations of species (9d)?	
a) no measures	
b) some measures in place	
c) potential measures under review	X
d) comprehensive measures in place	
If a developed country Party - 135. Has your country cooperated in providing financial and other support for ex situ conservation and in the establishment and maintenance of ex situ conservation facilities in developing countries (9e)? ***If a developing country Party or Party with economy in transition -*** 136. Has your country received financial and other support for ex situ conservation and in the establishment and maintenance of ex situ conservation facilities (9e)?	
a) no	
b) yes	X

Further comments on implementation of this Article

There are 24 botanical gardens in Ukraine, 15 major arboreta (belonging to forestry institutions and research stations and 84 memorial parks (park-monuments of landscape architecture and horticultural art. Of the memorial parks, 80% were founded in XVIII and XIX centuries. There are also 7 zoos in Ukraine.

Ukraine possesses rich genetic resources of species, varieties, forms, breeds, lines and strains of plants, animals and microorganisms representing both native and non-native taxa. 400 out of 470 higher plants listed in the national Red Data book are being cultivated in botanical gardens and dendrological parks. Ex-situ are maintained a number of rare and threatened species from Altai, Caucasus, Central Asia and Western Europe.. Presently there are about 30 thousand samples of introduced plant species cultivated in Ukraine. These resources are deposited and conserved in their natural environment and habitats, in cultivation, collections, gene banks, in numerous reserves, parks, botanical gardens, institutes, universities, etc. Ukraine has 478 genetic reserves of the total area 24.000 ha. The Central Botanical Garden of the National Academy of Sciences houses unique collections consisting of ca. 13.000 species, varieties, forms and cultivars of ornamental, medicinal, fodder, edible and other useful plants native to Ukraine and many other regions of the Globe, large pomological collections, etc. Of a special value are the collections of tropical and subtropical plants (more than 3.000 species and cultivars), one of the best in Europe orchid collection. The Nikita State Botanical Garden (Crimea) has a unique collection of ca. 9.300 species and cultivars of plants, it is one of the best representations of the flora of Mediterranean dry subtropics.

The main task of the Animal Genetic Resources Bank is conservation and improvement of local breeds of cattle and their use in cattle breeding. The bank contains ca. 1.700.000 sperm doses of bulls belonging to 20 milk breeds, 10 meat breeds and more than 12 synthetic populations. The collection of rare breeds and populations of fowl at the Institute of Fowl of the Ukrainian Agricultural Academy consists of 15 breed groups and populations. The Askania-Nova Zoo is regarded as the leading institution in the CIS countries and one of the best ten in the world, for its practical activities, experience and theoretical achievements in animal acclimatization and re-acclimatisation.

As one of results of international cooperation Ukrainian specialists have got access to software for creating a database of plants species in botanical gardens and of genetic plant resources.

However there is still no close cooperation with proper foreign organisations

Article 10 Sustainable use of components of biological diversity

137. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?

a) High	X	b) Medium		c) Low	

138. To what extent are the resources available adequate for meeting the obligations and recommendations made?

a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

Sustainable use of biological resources is an integrated part of national legislation. The principle of sustainable development, ensuring also the conservation and sustainable use of biodiversity has been enshrined in the most basic documents of Ukraine. The funding assigned to making sector policies more environmental-friendly is gradually increasing, though it is not equal to the needs.

Sustainable forest management has been the subject of several projects, however the objective have hardly been reached. There is a new program (adopted 2002) named "Forests of Ukraine" for the years 2002-2015 with a components aiming for sustainable forest use and biodiversity conservation. However there is lack of funding, so the programme is not being fully implemented.

139. Has your country integrated consideration of the conservation and sustainable use of biological resources into national decision making (10a)?	
a) no	
b) early stages of development	
c) advanced stages of development	X
d) programme or policy in place	
e) review of implementation available	
140. Has your country adopted measures relating to the use of biological resources that avoid or minimize adverse impacts on biological diversity (10b)?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
141. Has your country put in place measures that protect and encourage customary use of biological resources that is compatible with conservation or sustainable use requirements (10c)?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	

142. Has your country put in place measures that help local populations develop and implement remedial action in degraded areas where biological diversity has been reduced (10d)?	
a) no measures	X
b) some measures in place	
c) potential measures under review	
d) comprehensive measures in place	
143. Does your country actively encourage cooperation between government authorities and the private sector in developing methods for sustainable use of biological diversity (10e)?	
a) no	X
b) early stages of development	
c) advanced stages of development	
d) programme or policy in place	
e) review of implementation available	

Decisions IV/15. Relationship of the Convention with the Commission on Sustainable Development and biodiversity-related conventions

144. Has your country submitted to the Secretariat information on tourism and its impacts on biological diversity, and efforts to effectively plan and manage tourism?	
a) no	X
b) yes – previous national report	
c) yes – case-studies	
d) yes – other means (please give details below)	
145. Has your country submitted to the Secretariat information on biodiversity-related activities of the CSD (such as SIDS, oceans, seas and freshwater resources, consumption and production patterns)?	
a) no	X
b) yes - previous national report	
c) yes – correspondence	
d) yes - other means (please give details below)	

Decision V/24. Sustainable use as a cross-cutting issue

146. Has your country identified indicators and incentive measures for sectors relevant to the conservation and sustainable use of biodiversity?	
a) no	
b) assessment of potential indicators underway	X
c) indicators identified (if so, please describe below)	

147. Has your country assisted other Parties to increase their capacity to implement sustainable-use practices, programmes and policies at regional, national and local levels, especially in pursuit of poverty alleviation?	
a) no	X
b) not relevant	
c) to a limited extent	
d) to a significant extent (please provide details)	
148. Has your country developed mechanisms to involve the private sector and indigenous and local communities in initiatives on sustainable use, and in mechanisms to ensure that indigenous and local communities benefit from such sustainable use?	
a) no	X
b) mechanisms under development	
c) mechanisms in place (please describe)	
149. Has your country identified areas for conservation that would benefit through the sustainable use of biological diversity and communicated this information to the Executive Secretary?	
a) no	X
b) yes	

Decision V/25. Biological diversity and tourism

150. Has your country based its policies, programmes and activities in the field of sustainable tourism on an assessment of the inter-linkages between tourism and biological diversity?	
a) no	
b) to a limited extent	X
c) to a significant extent	
151. *Has your country submitted case-studies on tourism as an example of the sustainable use of biological diversity to the Executive Secretary*?	
a) no	X
b) yes	
152. Has your country undertaken activities relevant to biodiversity and tourism in support of the International Year of Ecotourism?	
a) no	X
b) yes	
153. Has your country undertaken activities relevant to biodiversity and tourism in support of the International Year of Mountains?	
a) no	
b) yes	X
154. Has your country undertaken activities relevant to biodiversity and tourism in support of the International Coral Reef Initiative?	
a) no	X
b) yes	
155. Has your country established enabling policies and legal frameworks to complement voluntary efforts for the effective implementation of sustainable tourism?	
a) no	
b) to a limited extent	X
c) to a significant extent (please describe)	

Further comments on implementation of this Article

Over a long period of time, the Ukrainian economy was developing with heavy structural disproportion. Ineffective economic system resulted in conditions for irrational use of resources. It did not recognize the value of natural resources and encourage conservation and effective use of resources, because it was oriented only at increased manufacturing and gross output.

The State environment policy of independent Ukraine is directed towards combination of economic development with non-depleting use of natural resources, comprehensive solution of economic and environmental problems. The adoption of the Constitution of Ukraine was an important step towards improvement of conservation sectors. The Constitutions proclaims the responsibility of the State to ensure ecological safety and maintain ecological stability and equilibrium.

One of the priorities declared by the "Main Directions of State Policy of Ukraine on Protection of the Environment, Use of Natural Resources and Ensuring Ecological Safety", adopted by Verkhovna Rada of Ukraine in 1998 is creation of balanced system of use of the environment with an adequate structural change in production potentials.

There is no a special law on conservation and sustainable use of biodiversity in Ukraine, but currently all corresponding issues are regulated by other active laws. For example, particular aspects of conservation, use and restoration of entities and objects of the plant and animal kingdoms are covered correspondingly by the laws "On Plant Kingdom" and "On Animal Kingdom", "Forest code", "On the Moratorium on Entire

Felling at the Mountainsides in Fir-Copper Beech Forests in Carpathian Region" as well as "On the Red Book of Ukraine".

An important element of the control over the level of use of certain components of biodiversity is the obligation that is to be described precisely by users of resources, e.g. in forest management plans, fisheries plans or plans for the harvesting of game animals. Supervision over the proper implementation of this use is exercised by the bodies denoted in the relevant Acts.

Ecotourism is mostly developed in the Carpathian region of Ukraine, and to a lesser extent in the Crimea. In the Carpathians both state and private sectors are involved. Especially activities occur in the wintertime. There are some minor activities concerning water sports.

Article 11 Incentive measures

156. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High	X	b) Medium		c) Low	

157. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

The Law "On environmental Protection of Ukraine" describes legal incentives for efficient natural resource use and protection of the natural environment. If enterprises switch to low-waste and resource-saving technologies, install recycling or treatment facilities or install control instruments for pollutant discharges, they qualify for tax privileges. In the nature protection legislation incentive measures are represented mainly by granting tax privileges for economic activity on the territories of the Nature protected areas fund and by anti-incentives in form of fines for exceeding the quotas or illegal removal of certain biological species as well as payments for environmental pollution. But restrictions and limits of different kind are still dominant in biodiversity conservation practice in Ukraine.

Incentive measures have not reckoned among the priorities of the policy of conservation and sustainable use of biological resources in Ukraine. It becomes apparently in poor integration of ecology-economic mechanisms into nature protection legislation and in ignoring factors of conservation and sustainable use of nature resources in economic legislation. The practical use of the present legislation norms is being complicated by unclear determination of property rights for nature resources in laws, lack of economically grounded monetary valuations of biological resources with regard for the factor of their renewal, poor executive discipline and by residual principle of budgetary financing of nature protecting measures as a whole (for example, in 2000 they made up 1.3% of all budget expenditures).

State directing bodies by their structure and orientation of activities demonstrate that they are not ready for the implantation of incentive measures in the sphere of conservation and sustainable use of nature resources at the moment. The most adapted is the profile of the Ministry of Environment and Nature Resources, but it is able to perform mainly nature-protecting functions.

The use of existing budget mechanisms for implantation of incentive measures is hampered since they have no instruments for ensuring effective and special purpose use of the funds which are entered into budgets of all levels as the payment for the use of nature resources and environmental pollution, with the aim of conservation and renewal of nature resources.

Environmental education in Ukraine is on the early stages of its development and has not acquired a systematic character. Environmental knowledge is poorly integrated into the educational programs of the subjects taught at secondary and high schools. The adopted Conception of environmental education has not still been embodied into the legislative and regulative acts of the state and is far from practical implementation. The environmental trends in Ukrainian education are represented by introduction of teaching the courses of studies on ecology and ecological economy at a series of higher educational institutions, experimental courses on ecology at secondary schools and some integration of ecological knowledge into the courses of studies on geography and valeology at secondary schools.

Implementation of Article 11 of the Convention on the Biodiversity requires the creation of adequate legislative, institutional and educational potential, internalization of the factor of sustainable use of nature resources into the economic mechanisms and policy of the state, raising the discipline of observing the laws, clear determination of property rights for nature resources and economical valuation of nature resources.

158. Are programmes in place to identify and ensure the adoption of economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) programmes in place	
e) review of implementation available	

Proposed in some programmes measures cannot be economically and socially important because the factor of conservation and sustainable use of components of biodiversity is not integrated into the state's economic and social policy. National programme of conservation and sustainable use of components of biodiversity as a complex document has not been adopted in Ukraine.	
159. Do these incentives, and the programmes to identify them and ensure their adoption, cover the full range of sectorial activities?	
a) no	
b) some sectors	X
c) all major sectors	
d) all sectors	

Decision III/18. Incentive measures

160. Has your country reviewed legislation and economic policies to identify and promote incentives for the conservation and sustainable use of components of biological diversity?	
a) no	
b) reviews in progress	X
c) some reviews complete	
d) as far as practically possible	
In the process of preparation of the Strategy of Sustained Development of Ukraine and the National Programme of conservation and sustainable use of biodiversity the propositions concerning the changes in the legislation and economic policy are being prepared.	
161. Has your country ensured the development of mechanisms or approaches to ensure adequate incorporation of both market and non-market values of biological diversity into plans, policies and programmes and other relevant areas, *inter alia*, national accounting systems and investment strategies?	
a) no	
b) early stages of identifying mechanisms	X
c) advanced stages of identifying mechanisms	
d) mechanisms in place	
e) review of impact of mechanisms available	
162. Has your country developed training and capacity building programmes to implement incentive measures and promote private-sector initiatives?	
a) no	
b) planned	X
c) some	
d) many	
Accepted Concept of Environment Education is the principles of design of the state programme which is being worked out. Implantation of particular training courses on ecology and ecological economy at some higher educational institutions does not affirm the development of training programs as yet. There are no capacities building programmes to implement incentive measures and promote private-sector initiatives since incentive measures with the object of conservation and sustainable use of biodiversity are not taken into state policy priorities.	
163. Has your country incorporated biological diversity considerations into impact assessments as a step in the design and implementation of incentive measures?	

a) no	X
b) yes	
164. Has your country shared experience on incentive measures with other Contracting Parties, including making relevant case-studies available to the Secretariat?	
a) no	X
b) yes - previous national report	
c) yes – case-studies	
d) yes - other means (please give details below)	

Decision IV/10. Measures for implementing the Convention [part]

165. Is your country actively designing and implementing incentive measures?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) measures in place	
e) review of implementation available	
Incentive measures are represented mainly by concession of tax. Privileges for economic activity on the territories of the natural reserve fund and in anti-incentives in the form of penalty for illegal removal or over the norm of individual biological species and payments for environmental contamination.	
166. Has your country identified threats to biological diversity and underlying causes of biodiversity loss, including the relevant actors, as a stage in designing incentive measures?	
a) no	
b) partially reviewed	X
c) thoroughly reviewed	
d) measures designed based on the reviews	
e) review of implementation available	
Threats to natural environment are identified partly in Reports about State of the Environment in Ukraine and in state programmes for conservation of water and forest resources. These threats are not accentuated as threats to biological diversity. The principal causes of biodiversity loss are identified partially in the National Report of Ukraine on Conservation of Biological Diversity (1997). Fragmentary information from the scientific research centers is being generalized.	
167. Do the existing incentive measures take account of economic, social, cultural and ethical valuation of biological diversity?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
168. Has your country developed legal and policy frameworks for the design and implementation of incentive measures?	
a) no	
b) early stages of development	
c) advanced stages of development	X

d) frameworks in place	
e) review of implementation available	
Fairly developed legal and policy frameworks for the design and implementation of incentive measures are not directed on fulfillment of these functions owing to the absence of the factor of conservation and sustainable use of components of biodiversity among the state policy priorities.	
169. Does your country carry out consultative processes to define clear target-oriented incentive measures to address the underlying causes of biodiversity loss?	
a) no	
b) processes being identified	
c) processes identified but not implemented	X
d) processes in place	
Such consultative processes are carried out conformably to accomplishment of international conventions and regional programmes.	
170. Has your country identified and considered neutralizing perverse incentives?	
a) no	X
b) identification programme under way	
c) identified but not all neutralized	
d) identified and neutralized	
Overwhelming majority of incentives in economic system of Ukraine are perverse incentives in conformity with conservation and sustainable use of the biodiversity components. Their neutralization requires revision of a number of economic system elements, which is possible under the condition, that the factor of conservation and sustainable use of components of biodiversity is included into the state policy priorities.	

Decision V/15. Incentive measures

171. Has your country reviewed the incentive measures promoted through the Kyoto Protocol to the UN Framework Convention on Climate Change?	
a) no	X
b) yes	
172. Has your country explored possible ways and means by which these incentive measures can support the objectives of the Convention on Biological Diversity in your country?	
a) no	
b) under consideration	X
c) early stages of development	
d) advanced stages of development	
e) further information available	

Further comments on implementation of this Article

To secure the implementation of Article 11 of Convention on Biodiversity in Ukraine the work under the target 'Incentive measures with the aim of sustainable use of nature resources' within the framework of the GEF/World bank project "Preparation of Biodiversity Phase II Enabling Activity" was carried out. The proposed incentive measures have systematic character and are aimed at eliminating the existing faults conformably to implementation of incentive measures with the aim of conservation and

sustainable use of components of biodiversity, pointed out in the commentaries to p.p.156-157 as well as at creating the potential for further development and implementation of incentive measures with the aim of sustainable use of nature resources and ensuring practical sustainable use of components of biodiversity. Implementation of the proposed first and foremost measures will allow to put the base for implementation of the abovementioned targets.

Article 12 Research and training

173. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	

174. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources
The problems of the period of transition ensure that this issue does not enjoy high-priority status in Ukraine at present time, while expenditure on it is too limited. Training in Ukraine is mostly undertaken in the frame of various international projects, e.g. forest specialists have been trained abroad and are capable of expertise concerning monitoring of forests (ICP FORESTS, FHM). However the State supports training of specialist dealing with environment protection through the State Institute for Training Specialists and through a system of existing universities.

175. Has your country established programmes for scientific and technical education and training in measures for the identification, conservation and sustainable use of biological diversity and its components (12a)?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) programmes in place	

176. Has your country provided support to other Parties for education and training in measures for the identification, conservation and sustainable use of biological diversity and its components (12a)?	
a) no	X
b) yes	

177. Does your country promote and encourage research which contributes to the conservation and sustainable use of biological diversity (12b)?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	

178. Does your country promote and cooperate in the use of scientific advances in biological diversity research in developing methods for conservation and sustainable use of biological resources (12c)?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	

If a developed country Party -	
179. Does your country's implementation of the above activities take into account the special needs of developing countries?	
a) no	
b) yes, where relevant	

With a view to the finance shortage, the Ministry of Environment and Natural Resources of Ukraine focuses its funds on scientific and technical support to the national and regional biodiversity related issues of high priority.

The Government finances the applied and fundamental researches on biodiversity in universities, institutes of National Academy of Science and Ministry of Environment and Natural resources of Ukraine (Ukrainian Research Institute of Sea Ecology; Ukrainian Scientific-technical Centre of Ecological Problems; Scientific Centre for Investigations in the Field of Nature Conservation).

Article 13 Public education and awareness

180. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	

181. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

Co-operation between State bodies and mass media is considered as one of the effective mechanisms for informing the public on the environmental situation in Ukraine. This co-operation has become a matter of special attention after Ukraine had ratified the Convention on Public Access to Information, Decision-Making and Justice on Environmental Issues. Press conferences dedicated to urgent environmental issues became a common practice for the Ministry of Environment and Natural Resources of Ukraine.

However, the current activities of the Ukrainian Government, Ministry of Environment and Natural Resources of Ukraine, NGOs and other stakeholders as regards public education and awareness are not able to prevent degradation of some biodiversity components in Ukraine. Available local and foreign donors' financial resources do not allow performing needed spectre of activities to get changes in the negative trends.

182. Does your country promote and encourage understanding of the importance of, and the measures required for, the conservation of biodiversity (13a) through media?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
183. Does your country promote and encourage understanding of the importance of, and the measures required for, the conservation of biodiversity (13a) through the inclusion of this topic in education programmes?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
184. Does your country cooperate with other States and international organizations in developing relevant educational and public awareness	

programmes (13b)?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	

Decision IV/10. Measures for implementing the Convention [part]

185. Are public education and awareness needs covered in the national strategy and action plan?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	

186. Has your country allocated appropriate resources for the strategic use of education and communication instruments at each phase of policy formulation, implementation and evaluation?	
a) limited resources	X
b) significant but not adequate resources	
c) adequate resources	
187. Does your country support initiatives by major groups that foster stakeholder participation and that integrate biological diversity conservation matters in their practice and education programmes?	
a) no	
b) yes	X
188. Has your country integrated biodiversity concerns into education strategies?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) yes	
189. Has your country made available any case-studies on public education and awareness and public participation, or otherwise sought to share experiences?	
a) no	X
b) yes	
190. Has your country illustrated and translated the provisions of the Convention into any local languages to promote public education and awareness raising of relevant sectors?	
a) not relevant	
b) still to be done	X
c) under development	
d) yes	
191. Is your country supporting local, national, sub-regional and regional education and awareness programmes?	
a) no	

b) yes – limited extent	X
c) yes – significant extent	
If a developing country Party or Party with economy in transition – 192. When requesting assistance through the GEF, has your country proposed projects that promote measures for implementing Article 13 of the Convention?	
a) no	
b) yes	X

Decision V/17. Education and public awareness

193. Does your country support capacity-building for education and communication in biological diversity as part of the national biodiversity strategy and action plans?	
a) no	
b) limited support	X
c) yes (please give details)	

Further comments on implementation of this Article

The Strategy of conservation of Ukraine's Biological Diversity considers education and public awareness as one of the basic instruments for implementation of the Strategy. In order to improve ecological education, the creation of information and education centers is contemplated on the basis of territories of the nature reserve fund. Publication of popular scientific and other kinds of literature is to be increased; a series of relevant popular scientific TV- and radio programs is to be initiated. Revision of curricula and training programs is to be carried out at pre-school institutions, secondary and higher educational establishments in order to broaden the knowledge of biodiversity, improve training and upgrading of skills of specialists in the sphere of biodiversity conservation, taking into account the international experience.

The Annual National Reports of the State of Environment in Ukraine describe partially the work done in the frame of environmental education, public awareness and public movements (including NGOs involvement).

The last years in Ukraine special attention is paid to the ecological education. The speciality "Ecology" has been recently added to the official List of Specialities of higher education in Ukraine. The new obligatory course "Principles of Ecology' has been added to curriculums of higher education, relevant programmes and manuals have been prepared and published. During recent years, efforts have been made to involve all age groups of the population in ecological education (including biodiversity aspects). However, attention is paid principally to the ecological education of the younger generation. There are about 200 (This is information need check)Young Naturalist Centres in Ukraine. The main tasks of the Small Academy of Sciences "Youth Academy' as well as Ukrainian State Ecological and Naturalistic Center are to develop of ecological and environmental education and the active promotion of care for the Earth.

An analysis of modern education programmes, manuals, guides and diverse normative documents points to the fact that there is an urgent need for a National Programme for Uninterrupted Ecological Education as a part of the concept for Ukraine's Transition to Sustainable Development. At present time the Ministry of Education is working on national standards to specify the contents of the secondary- school and higher-school ecological education. Courses to train ecologists were networked taking into account the economic needs of regions.

Several hundreds of Public ecological organisations varying in strength and orientation are active in Ukraine. Among them, the most active and efficient NGOs are following: National EcoCenter, Ukrainian Geographical Society, Ukrainian Ecological League, Ukrainian Green World Ecological Association. A number of independent bar associations integrated under the common title 'EcoLaw" (there are EcoLaw-Kyiv, EcoLaw-Lviv, EcoLaw-Kharkiv). The Public Council for the Ministry of the Environment

and Natural Resources of Ukraine that is composed of national-level ecological organisations continues its activity.

Article 14 Impact assessment and minimizing adverse impacts

194. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	
195. To what extent are the resources available adequate for meeting the obligations and recommendations made?					
a) Good		b) Adequate		c) Limiting	X
Further comments on relative priority and on availability of resources					

The assessment of environmental impacts is regulated by the Law "On Ecological Expertise". It states that the aim of ecological expertise is "to prevent the negative impact of anthropogenic activities on the environment, and evaluate the level of environmental safety of economic activities and environmental situations in individual territories and facilities". According to this law the Ministry of Environment and Natural resources of Ukraine performs ecological expertise of documentation in new machinery, technologies, materials and substances.

The problems are:

1. Lack of system approach in the practice to environmental impact assessment, evaluation and application;
2. Imperfection of assessment, counting and using methods applying for part of natural resources;
3. Low financial support to development and maintenance of natural resources cadastres and scrutiny researches

The current obstacles for that are:

- Incompleteness of the country natural resources cadastre development (it is difficult to assess and calculate immaterial resources, as well as those ones, for which norms of assessment, accounting and usage haven't been developed);
- Target (management-economic) orientation of the development of cadastres on the branch basis, i.e. incomplete reflection of natural resources (for example, in forest branch, it is wood, games, non-wood production, sap, blood, mushrooms, berries, drug plants, etc.). Natural conservation fund holds the data of all species and communities which demand protection (Red book, Green book). As a result of such approach many other representatives of biota remain outside of attention or are studied partly within the framework of special researches;
- The lack of the information on actual complex anthropogenous influence on natural ecosystems and degrees of their degradation (only fragmentary data exist). The data on separate components of ecosystems (biota objects), on separate types of influences (specific threats) do not present an adequate picture of actual situation. Therefore, the system approach is needed to be used.

Anthropogenic influence on natural ecosystems has multifactor, dynamic and stochastic nature. At current stage the separate aspects are developed, concerning diagnostics of anthropogenic transformation of natural objects, sanitary - hygienic norms of environmental contamination, etc. Among them are:

1) At branch levels of wildlife management,
2) On separate components of ecosystems (including biological objects),
3) On separate types of influences,
4) On separate types of ecosystems.

Some fragmentary data on ecosystem components, specific threats, etc are summarized at the national level. Thus, the main properties of ecosystem (self-control, self-development, etc.) and effects from complex factors (synergism, additivety, and neutralization) are not taken into account. Ecological norms of anthropogenous loadings on nature are in an initial stage of realization (the concept was developed and there are first examples of ecological norms (for air pollution, forest ecosystems)).

At the start of 90^{th} of last century the environmental impact assessments for projects which had impacts on environment were openly conducting with participation of many scientists and specialists. The results of each environmental impact assessment were discussed with involvement of a public and NGOs. Since the second half of 90^{th} not all projects began to be exposed to environmental impact assessment, because of changes in legislation. Currently, the scientists and specialists from high schools and academic institutes are rare participants in carrying out environmental impact assessments. For example, erections of many cottages have been made without any environmental impact assessment for last years. Today's state of art in Ukraine affords often unpredictable, inadequate and rapid carrying out environmentally dangerous projects with adverse impact to biodiversity.

Thus, Ukraine needs to implement this Article in full range as soon as possible. However, financial and social resources are too severely limiting to be adequate for meeting the obligations and recommendations, because of transitional character of economy and somehow scientifically and environmentally neglecting policy.

196. Is legislation in place requiring an environmental impact assessment of proposed projects likely to have adverse effects on biological diversity (14 (1a))?	
a) no	
b) early stages of development	
c) advanced stages of development	X
d) legislation in place	
e) review of implementation available	
197. Do such environmental impact assessment procedures allow for public participation (14(1a))?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
198. Does your country have mechanisms in place to ensure that the environmental consequences of national programmes and policies that are likely to have significant adverse impacts on biological diversity are duly taken into account (14(1b))?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) fully compliant with current scientific knowledge	
199. Is your country involved in bilateral, regional and/or multilateral discussion on activities likely to significantly affect biological diversity outside your country's jurisdiction (14(1c))?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
200. Is your country implementing bilateral, regional and/or multilateral agreements on activities likely to significantly affect biological diversity outside your country's jurisdiction (14(1c))?	
a) no	
b) no, assessment of options in progress	X
c) some completed, others in progress	
b) yes	
201. Has your country mechanisms in place to notify other States of cases of imminent or grave danger or damage to biological diversity originating in your country and potentially affecting those States (14(1d))?	
a) no	
b) early stages of development	
c) advanced stages of development	X
d) mechanisms in place	
e) no need identified	
202. Has your country mechanisms in place to prevent or minimize danger or damage originating in your State to biological diversity in other States or in areas beyond the limits of national jurisdiction (14(1d))?	

a) no	
b) early stages of development	X
c) advanced stages of development	
d) fully compliant with current scientific knowledge	
e) no need identified	
203. Has your country national mechanisms in place for emergency response to activities or events which present a grave and imminent danger to biological diversity (14(1e))?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) mechanisms in place	
204. Has your country encouraged international cooperation to establish joint contingency plans for emergency responses to activities or events which present a grave and imminent danger to biological diversity (14(1e))?	
a) no	
b) yes	X
c) no need identified	

Decision IV/10. Measures for implementing the Convention **[part]**

205. Has your country exchanged with other Contracting Parties information and experience relating to environmental impact assessment and resulting mitigating measures and incentive schemes?	
a) no	X
b) information provided to the Secretariat	
c) information provided to other Parties	
d) information provided on the national CHM	
206. Has your country exchanged with other Contracting Parties information on measures and agreements on liability and redress applicable to damage to biological diversity?	
a) no	X
b) information provided to the Secretariat	
c) information provided to other Parties	
d) information provided on the national CHM	

Decision V/18. Impact assessment, liability and redress

207. Has your country integrated environmental impact assessment into programmes on thematic areas and on alien species and tourism?	
a) no	
b) partly integrated	X
c) fully integrated	
208. When carrying out environmental impact assessments does your country address loss of biological diversity and the interrelated socio-economic, cultural and human-health aspects relevant to biological diversity?	
a) no	

b) partly	X
c) fully	
209. When developing new legislative and regulatory frameworks, does your country have in place mechanisms to ensure the consideration of biological diversity concerns from the early stages of the drafting process?	
a) no	
b) in some circumstances	X
c) in all circumstances	
210. Does your country ensure the involvement of all interested and affected stakeholders in a participatory approach to all stages of the assessment process?	
a) no	
b) yes - in certain circumstances	X
c) yes - in all cases	
211. Has your country organised expert meetings, workshops and seminars, and/or training, educational and public awareness programmes and exchange programmes in order to promote the development of local expertise in methodologies, techniques and procedures for impact assessment?	
a) no	
b) some programmes in place	X
c) many programmes in place	
d) integrated approach to building expertise	
212. Has your country carried out pilot environmental impact assessment projects, in order to promote the development of local expertise in methodologies, techniques and procedures?	
a) no	X
b) yes (please provide further details)	
213. Does your country use strategic environmental assessments to assess not only the impact of individual projects, but also their cumulative and global effects, and ensure the results are applied in the decision making and planning processes?	
a) no	
b) to a limited extent	X
c) to a significant extent	
214. Does your country require the inclusion of development of alternatives, mitigation measures and consideration of the elaboration of compensation measures in environmental impact assessment?	
a) no	
b) to a limited extent	
c) to a significant extent	X
215. Is national information available on the practices, systems, mechanisms and experiences in the area of strategic environmental assessment and impact assessment?	
a) no	X
b) yes (please append or summarise)	

Further comments on implementation of this Article

For long time in former USSR countries such environment information had the status "for official use". Now some exhaustive data are also difficult to get on the reasons considered above, and also due to:

- Insufficient information support of experts;
- Insufficient transparency of administrative decisions and their consequences;
- Low level of financial support.

Generally, results of scientific researches and official statistical materials are accessible, that creates conditions for performance of project tasks at satisfactory level (in view of marked above problems**)**.

Up to this moment the environmental impact assessment is badly integrated into programmes on thematic areas.

Losses of biodiversity are bounded by socio-economic, cultural and human-health problems.

Unfortunately, the assessment procedures are not fully opened and transparent for public. Not all stakeholders can and are involved in the assessment processes. The methodology of carrying out of expertise is weakly improved. Strategic environmental assessments are not applied practically. There are no methods of cumulative effects assessment.

Like in many countries with economy in transition, issues concerning impact environmental assessment, liability and redress are considered to be avoidable. Even in case of developing some important laws and projects, their implementation seems to be remaining open to question.

Ukraine carried out some pilot environmental impact assessment projects, in order to promote the development of local expertise in methodologies, techniques and procedures (Air Pollution and Climate Change Effects on Health of the Ukrainian Forests: Monitoring and Evaluation, etc)

Article 15 Access to genetic resources

216. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	

217. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

In Ukraine there are only limited information in particular scientific departments about genetic resources only for some species, as a rule, only wild ones. Moreover, resources are rather accessible, but mostly aren't requested. Implementation of the Article is on early stages of development.

218. Has your country endeavoured to create conditions to facilitate access to genetic resources for environmentally sound uses by other Contracting Parties (15(2))?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
219. Is there any mutual understanding or agreement in place between different interest groups and the State on access to genetic resources (15(4))?	
a) no	

b) yes – limited extent	X
c) yes – significant extent	
220. Has your country an open participation planning process, or any other process in place, to ensure that access to resources is subject to prior informed consent (15(5))?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) processes in place	
221. Has your country taken measures to ensure that any scientific research based on genetic resources provided by other Contracting Parties is developed and carried out with the full participation of such Contracting Parties (15(6))?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
222. Has your country taken measures to ensure the fair and equitable sharing of the results of research and development and the benefits arising from the commercial and other use of genetic resources with any Contracting Party providing such resources (15(7))?	
a) no measures	
b) some measures in place	
c) potential measures under review	X
d) comprehensive measures in place	
If so, are these measures	
a) Legislation	X
b) Statutory policy or subsidiary legislation	
c) Policy and administrative measures	

Decision II/11 and Decision III/15. Access to genetic resources

223. Has your country provided the secretariat with information on relevant legislation, administrative and policy measures, participatory processes and research programmes?	
a) no	X
b) yes, within the previous national report	
c) yes, through case-studies	
d) yes, through other means (please give details below)	
224. Has your country implemented capacity-building programmes to promote successful development and implementation of legislative, administrative and policy measures and guidelines on access, including scientific, technical, business, legal and management skills and capacities?	
a) no	
b) some programmes covering some needs	X
c) many programmes covering some needs	
d) programmes cover all perceived needs	
e) no perceived need	
225. Has your country analysed experiences of legislative, administrative and policy	

measures and guidelines on access, including regional efforts and initiatives, for use in further development and implementation of measures and guidelines?	
a) no	
b) analysis in progress	X
c) analysis completed	
226. Is your country collaborating with all relevant stakeholders to explore, develop and implement guidelines and practices that ensure mutual benefits to providers and users of access measures?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
227. Has your country identified national authorities responsible for granting access to genetic resources?	
a) no	
b) yes	X
228. Is your country taking an active role in negotiations associated with the adaptation of the International Undertaking on Plant Genetic Resources for Food and Agriculture?	
a) no	X
b) yes	

Decision V/26. Access to genetic resources

229. Has your country designated a national focal point and one or more competent national authorities to be responsible for access and benefit-sharing arrangements or to provide information on such arrangements?	
a) no	
b) yes	X
c) yes, and Executive Secretary notified	
230. Do your country's national biodiversity strategy, and legislative, administrative or policy measures on access and benefit-sharing, contribute to conservation and sustainable use objectives?	
a) no	
b) to a limited extent	X
c) to a significant extent	
Parties that are recipients of genetic resources 231. Has your country adopted administrative or policy measures that are supportive of efforts made by provider countries to ensure that access to their genetic resources is subject to Articles 15, 16 and 19 of the Convention?	
a) no	X
b) other arrangements made	
c) yes	
232. Does your country co-operate with other Parties in order to find practical and equitable solutions supportive of efforts made by provider countries to ensure that access to their genetic resources is subject to Articles 15, 16 and 19 of the Convention, recognizing the complexity of the issue, with particular consideration of the multiplicity of prior informed consent considerations?	

a) no	X
b) yes (please provide details)	
233. In developing its legislation on access, has your country taken into account and allowed for the development of a multilateral system to facilitate access and benefit-sharing in the context of the International Undertaking on Plant Genetic Resources?	
a) no	
b) legislation under development	X
c) yes	
234. Is your country co-ordinating its positions in both the Convention on Biological Diversity and the International Undertaking on Plant Genetic Resources?	
a) no	
b) taking steps to do so	X
c) yes	
235. Has your country provided information to the Executive Secretary on user institutions, the market for genetic resources, non-monetary benefits, new and emerging mechanisms for benefit sharing, incentive measures, clarification of definitions, *sui generis* systems and "intermediaries"?	
a) no	X
b) some information provided	
c) substantial information provided	
236. Has your country submitted information on specific issues related to the role of intellectual property rights in the implementation of access and benefit-sharing arrangements to the Executive Secretary?	
a) no	X
b) yes	
237. Has your country provided capacity-building and technology development and transfer for the maintenance and utilization of ex situ collections?	
a) no	
b) yes to a limited extent	X
c) yes to a significant extent	

Further comments on implementation of this Article

Ukraine possesses rich genetic resources of species, varieties, forms, breeds, lines and strains of plants, animals and microorganisms representing both native and non-native taxa. These resources are deposited and conserved in their natural environment and habitats, in cultivation, collections, gene banks, in numerous reserves, parks, botanical gardens, institutes, universities, etc. Ukraine has 478 genetic reserves of the total area 24.000 ha., etc.

Genetic collections and gene banks at some institutes of the National Academy of Science of Ukraine are extremely rich and in many aspects unique. The collection of microbial cultures at the Institute of Microbiology and Virology contains 20 000 strains, including unique samples of phytopathogenic microflora, parasitic fungi etc.

The gene bank (100 units), collections of recombinant DNK (200 units) and microbes-producers of medical substances (200 units) are created at the Institute of Molecular Biology and Genetics. The bank of cell lines at the institute of Experimental pathology, Oncology and Radiobiology contains 14 000 lines of human and animal cells; ca. 200 of these lines are unique. The Center of Genetic Resources of the Institute of Plant Growing unites several unique collections into the integrated system of genetic resources of cultivated plants, which includes the following important part: collection of field crops at the Institute of Plant Growing (42 000 specimens); collection of medical plants at the institute of Medical Plants (ca. 500 specimens); pomology collection at the Institute of Pomology (7 000 specimens); ampelographic collection at the institute of Viticulture and Wine Production (485 specimens). Every one of the mentioned collections is at least the third in the world by the value.

The collections and gene banks of many research institutions, ministries and agencies are extremely important for conservation of both natural and cultivated genetic and species biodiversity. According to the "Regulations for procedure of selecting national heritage scientific objects" (1997) the State Register of such objects has been established.

Now Ukraine begins the way of developing the necessary organizing and controlling structures and rules for participation in World Associations on the genetic resources using and conservation. Only some Ukrainian reserves participated in this work really, that was actually the result of private initiatives mostly than country's direction. It is determined by the youth of Ukraine as independent country and the need to create new laws and corresponding structures.

Article 16 Access to and transfer of technology

238. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium		c) Low	X

239. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

Biodiversity resources in Ukrainian are very significant. There are many species included in "Red Book", many older breeds and varieties, but the transition state of Ukrainian economy hampers their control and conservation. Transfer of technologies is often complicated due to bureaucratic procedures.

240. Has your country taken measures to provide or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment (16(1))?	
a) no measures	
b) some measures in place	
c) potential measures under review	X
d) comprehensive measures in place	
241. Is your country aware of any initiatives under which relevant technology is transferred to your country on concessional or preferential terms (16(2))?	
a) no	X
b) yes (please give brief details below)	
242. Has your country taken measures so that Contracting Parties which provide genetic resources are provided access to and transfer of technology which make use of those resources, on mutually agreed terms (16(3))?	
a) not relevant	
b) relevant, but no measures	
c) some measures in place	
d) potential measures under review	X
e) comprehensive measures in place	
If so, are these measures	
a) Legislation	
b) Statutory policy or subsidiary legislation	X
c) Policy and administrative arrangements	
243. Has your country taken measures so that the private sector facilitates access to joint development and transfer of relevant technology for the benefit of government institutions and the private sector of developing countries (16(4))?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
If so, are these measures	
a) Legislation?	X
b) Statutory policy and subsidiary legislation?	
c) Policy and administrative arrangements?	
244. Does your country have a national system for intellectual property right protection (16(5))?	
a) no	
b) yes	X
245. If yes, does it cover biological resources (for example, plant species) in any way?	
a) no	
b) yes – limited extent	X

c) yes – significant extent	

Decision III/17. Intellectual property rights

246. Has your country conducted and provided to the secretariat case-studies of the impacts of intellectual property rights on the achievement of the Conventions objectives?	
a) no	X
b) some	
c) many	

Further comments on implementation of this Article

There are not specific provisions in existing legal acts on intellectual property rights as for bioresources. Bioresources are an integrated part within the national legislation on intellectual property and are covered in the same extent as other types.

Due to the absence of effective mechanisms, currently Ukraine can not take measures to provide or facilitate access and transfer of technologies to other Parties that are relevant to the conservation and sustainable use of biological diversity.

Article 17 Exchange of information

247. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	

248. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

Conservation of biological and landscape diversity has been recognized as one of the most important priorities of the Ukrainian Government. However, this priority is not supported by necessary resources. For example, in comparison with 2002, financing for the conservation of the Nature Protected Areas Fund in 2003 was decreased from 11.7 to 9.7 million hryvna (equivalent to USD 1.82 million).

Owing to corresponding causes the ability of exchange of information was deeply cut back in Ukraine in accessing the foreign editions of books, journals and collection of reviews not only for the individual scientists, but for the libraries of both national and local levels.

This sector needs more effective support by the state and foreign institutions.

249. Has your country taken measures to facilitate the exchange of information from publicly available sources (17(1))?	
a) no measures	
b) restricted by lack of resources	X
c) some measures in place	
d) potential measures under review	
e) comprehensive measures in place	

If a developed country Party -
250. Do these measures take into account the special needs of developing countries (17(1))?

a) no	
b) yes – limited extent	
c) yes – significant extent	

251. If so, do these measures include all the categories of information listed in Article 17(2), including technical, scientific and socio-economic research, training and surveying programmes, specialized knowledge, repatriation of information and so on?

a) no	
b) yes – limited extent	
c) yes – significant extent	

Article 18 Technical and scientific cooperation

252. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?

a) High		b) Medium	X	c) Low	

253. To what extent are the resources available adequate for meeting the obligations and recommendations made?

a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources

Because of deficiency of resources and limited information on advanced concepts on various aspects of biodiversity conservation, technical and scientific cooperation is the important condition for biodiversity in Ukraine.

The Ukrainian legislation, specifically Article 66 of the Law on Nature Reserve Fund, gives wide possibilities for the scientific cooperation and exchange of scientific information, specifically by means of special programs, development and creation of transboundary nature conservation territories.

Strengthening of the cooperation between key Ukrainian ministries is necessary.

254. Has your country taken measures to promote international technical and scientific cooperation in the field of conservation and sustainable use of biological diversity (18(1))?

a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	

255. Do the measures taken to promote cooperation with other Contracting Parties in the implementation of the Convention pay special attention to the development and strengthening of national capabilities by means of human resources development and institution building (18(2))?

a) no	
b) yes – limited extent	X
c) yes – significant extent	

256. Has your country encouraged and developed methods of cooperation for the development and use of technologies, including indigenous and traditional technologies, in pursuance of the objectives of this Convention (18(4))?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) methods in place	

257. Does such cooperation include the training of personnel and exchange of experts (18(4))?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
258. Has your country promoted the establishment of joint research programmes and joint ventures for the development of technologies relevant to the objectives of the Convention (18(5))?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	

Decision II/3, Decision III/4 and Decision IV/2. Clearing House Mechanism

259. Is your country cooperating in the development and operation of the Clearing House Mechanism?	
a) no	
b) yes	X
260. Is your country helping to develop national capabilities through exchanging and disseminating information on experiences and lessons learned in implementing the Convention?	
a) no	
b) yes - limited extent	X
c) yes – significant extent	
261. Has your country designated a national focal point for the Clearing-House Mechanism?	
a) no	
b) yes	X
262. Is your country providing resources for the development and implementation of the Clearing-House Mechanism?	
a) no	X
b) yes, at the national level	
c) yes, at national and international levels	
263. Is your country facilitating and participating in workshops and other expert meetings to further the development of the CHM at international levels?	
a) no	X
b) participation only	
c) supporting some meetings and participating	

264. Is your CHM operational	
a) no	
b) under development	X
c) yes (please give details below)	
265. Is your CHM linked to the Internet	
a) no	
b) yes	X
266. Has your country established a multi-sectoral and multi-disciplinary CHM steering committee or working group at the national level?	
a) no	X
b) yes	

Decision V/14. Scientific and technical co-operation and the clearinghouse mechanisms (Article 18)

267. Has your country reviewed the priorities identified in Annex I to the decision, and sought to implement them?	
a) not reviewed	
b) reviewed but not implemented	X
c) reviewed and implemented as appropriate	

Further comments on implementation of these Articles

A Clearing House Mechanism (CHM) was to be established in Ukraine to accelerate implementation of the Convention on Biological Diversity.

The tasks to be fulfilled by the National Ukrainian CHM are in accordance with a purpose of the CBD and relevant decisions of the Conference of the Parties and recommendations of the Subsidiary Body on Scientific, Technical and Technological Advice.

The Ministry for Environment and Natural Resources designated the CHM Focal Point in Ukraine.

Under the GEF/World Bank project Preparation Biodiversity Phase II Enabling Activity GEF-PPG TF028968, the Ministry for Environment and Natural Resources is to promote development of the CHM in Ukraine through appropriate hardware, software, and technical support. Ukrainian National CHM network web-sites with the regional Focal points for facilitating implementation of the CBD will be established under the project.

Article 19 Handling of biotechnology and distribution of its benefits

268. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	

269. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources	
There are some build-ups - separate links of biotechnologies and benefits are being distributed. Ukraine has very high scientific potential for using and development of new biotechnologies, but does not have the needed financial support for implementation.	

270. Has your country taken measures to provide for the effective participation in biotechnological research activities by those Contracting Parties which provide the genetic resources for such research (19(1))?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	
If so, are these measures:	
a) Legislation	X
b) Statutory policy and subsidiary legislation	
c) Policy and administrative measures	

271. Has your country taken all practicable measures to promote and advance priority access on a fair and equitable basis by Contracting Parties to the results and benefits arising from biotechnologies based upon genetic resources provided by those Contracting Parties (19(2))?	
a) no measures	
b) some measures in place	X
c) potential measures under review	
d) comprehensive measures in place	

Decision IV/3. Issues related to biosafety and Decision V/1. Work Plan of the Intergovernmental Committee for the Cartagena Protocol on Biosafety

272. Is your country a Contracting Party to the Cartagena Protocol on Biosafety?	
a) not a signatory	
b) signed, ratification in progress	
c) instrument of ratification deposited	X

Further comments on implementation of this Article

The Law on accession to the Cartagena Protocol "On Biosafety of GMOs and Products Thereof" was ratified on September 12, 2002.

Article 20 Financial resources

273. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High	X	b) Medium		c) Low	

274. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources
There are a few sources of financing environmental expenditure in Ukraine: budgetary funds, enterprises' own funds and foreign loans and grants. The partial financial support for biodiversity conservation is provided through the National Environmental Protection Fund that was established as a part of the National Budget of Ukraine in order to concentrate funds and provide financing for environmental protection and resource-saving measures, including relevant scientific research and measures aimed at reducing of the impact of human activity on health and nature. The Fund gathers charges from pollution and other funds under the current legislation that are to be received to the National Budget of Ukraine. The Fund's administrator is the Ministry of Environment and Natural Resources of Ukraine. Means of the Fund are to provide financial support for activities that are in conformity with the priorities of the national environmental policy of Ukraine.

275. Has your country provided financial support and incentives in respect of those national activities which are intended to achieve the objectives of the Convention (20(1))?	
a) no	
b) yes – incentives only	
c) yes – financial support only	
d) yes – financial support and incentives	X

If a developed country Party – 276. Has your country provided new and additional financial resources to enable developing country Parties to meet the agreed incremental costs to them of implementing measures which fulfil the obligations of the Convention, as agreed between you and the interim financial mechanism (20(2))?	
a) no	
b) yes	

If a developing country Party or Party with economy in transition – 277. Has your country received new and additional financial resources to enable you to meet the agreed full incremental costs of implementing measures which fulfil the obligations of the Convention (20(2))?	
a) no	
b) yes	X

If a developed country Party -	
278. Has your country provided financial resources related to implementation of the Convention through bilateral, regional and other multilateral channels (20(3))?	
If a developing country Party or Party with economy in transition -	
279. Has your country used financial resources related to implementation of the Convention from bilateral, regional and other multilateral channels (20(3))?	
a) no	
b) yes	X

Decision III/6. Additional financial resources

280. Is your country working to ensure that all funding institutions (including bilateral assistance agencies) are striving to make their activities more supportive of the Convention?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
281. Is your country cooperating in any efforts to develop standardized information on financial support for the objectives of the Convention?	
a) no	
b) yes (please attach information)	X

Decision V/11. Additional financial resources

282. Has your country established a process to monitor financial support to biodiversity?	
a) no	
b) procedures being established	X
c) yes (please provide details)	
283. Are details available of your country's financial support to national biodiversity activities?	
a) no	
b) not in a standardized format (partly)	X
c) yes (please provide details)	
284. Are details available of your country's financial support to biodiversity activities in other countries?	
a) not applicable	X
b) no	
c) not in a standardized format	
d) yes (please provide details)	

Developed country Parties - 285. Does your country promote support for the implementation of the objectives of the Convention in the funding policy of its bilateral funding institutions and those of regional and multilateral funding institutions?	
a) no	
b) yes	
Developing country Parties - 286. Does your country discuss ways and means to support implementation of the objectives of the Convention in its dialogue with funding institutions?	
a) no	
b) yes	X
287. Has your country compiled information on the additional financial support provided by the private sector?	
a) no	X
b) yes (please provide details)	
288. Has your country considered tax exemptions in national taxation systems for biodiversity-related donations?	
a) no	
b) not appropriate to national conditions	
c) exemptions under development	X
d) exemptions in place	

Further comments on implementation of this Article

The shortage of available funds is the most serious obstacle to the proper execution of Ukraine's responsibilities as a Party of CBD. International co-operation is considered the most important tool in resolving national and international problems in bio- and landscape diversity. That is why international technical and financial support for implementation of concrete projects provided by international bodies and institutions (GEF, WB, UNEP etc.) as well as developed countries (the Netherlands, United Kingdom, Italy, Lichtenstein, Denmark, Germany etc.) are especially important and greatly appreciated by Ukraine. For example, so far such large projects as "Transcarpathian Biodiversity Protection Project" (GEF, US$ 585,000) and "Danube Delta Biodiversity Project", Ukraine" (GEF, US$ 1500,000) has been successfully completed and their outputs are very important for the project's regions and Ukrainian biodiversity countrywide. The "Azov-Black Seas Corridor Biodiversity Conservation Project" (GEF, 6.900.000 US$) became effective in 2003 and Ministry of Environment and Nature Resources of Ukraine looks forward for its outputs.

Ukrainian-Netherlands co-operation on environmental protection involves general environment management, Development of Protected Areas Fund of Ukraine, water resources management. In 1998 Ukraine received assistance from the Government of the Netherlands.

Article 21 Financial mechanism

289. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?					
a) High		b) Medium	X	c) Low	

290. To what extent are the resources available adequate for meeting the obligations and recommendations made?							
a) Good		b) Adequate		c) Limiting	X	d) Severely limiting	

Further comments on relative priority and on availability of resources
International technical and financial support to Ukraine for implementation of the CBD is very valuable and important and Ukraine highly appreciates any support of this kind.

291. Has your country worked to strengthen existing financial institutions to provide financial resources for the conservation and sustainable use of biological diversity?	
a) no	
b) yes	X

Decision III/7. Guidelines for the review of the effectiveness of the financial mechanism

292. Has your country provided information on experiences gained through activities funded by the financial mechanism?	
a) no activities	
b) no, although there are activities	
c) yes, within the previous national report	
d) yes, through case-studies	X
e) yes, through other means (please give details below)	

Article 23 Conference of the Parties

293. How many people from your country participated in each of the meetings of the Conference of the Parties?	
a) COP 1 (Nassau)	-
b) COP 2 (Jakarta)	1
c) COP 3 (Buenos Aires)	-
d) COP 4 (Bratislava)	2
e) COP 5 (Nairobi)	-

Decision I/6, Decision II/10, Decision III/24 and Decision IV/17. Finance and budget

294. Has your country paid all of its contributions to the Trust Fund?	
a) no	X
b) yes	

Decision IV/16 (part) Preparation for meetings of the Conference of the Parties

295. Has your country participated in regional meetings focused on discussing implementation of the Convention before any meetings of the Conference of the Parties?	
a) no	
b) yes (please specify which) Meeting of the Group of experts for setting up of the Emerald Net of Areas of Special Conservation Interest (Riga, Latvia -2002)	X
If a developed country Party – 296. Has your country funded regional and sub-regional meetings to prepare for the COP, and facilitated the participation of developing countries in such meetings?	
a) no	X
b) yes (please provide details below)	

Decision V/22. Budget for the programme of work for the biennium 2001-2002

297. Did your country pay its contribution to the core budget (BY Trust Fund) for 2001 by 1st January 2001?	
a) yes in advance	
b) yes on time	
c) no but subsequently paid	
d) not yet paid	X

298. Has your country made additional voluntary contributions to the trust funds of the Convention?	
a) yes in the 1999-2000 biennium	
b) yes for the 2001-2002 biennium	
c) expect to do so for the 2001-2002 biennium	
d) no	X

Article 24 Secretariat

299. Has your country provided direct support to the Secretariat in terms of seconded staff, financial contribution for Secretariat activities, etc?	
a) no	X
b) yes	

Article 25 Subsidiary body on scientific, technical and technological advice

300. How many people from your country participated in each of the meetings of SBSTTA?	
a) SBSTTA I (Paris)	1
b) SBSTTA II (Montreal)	1
c) SBSTTA III (Montreal)	1
d) SBSTTA IV (Montreal)	1
e) SBSTTA V (Montreal)	1

Article 26 Reports

301. What is the status of your first national report?	
a) Not submitted	
b) Summary report submitted	
c) Interim/draft report submitted	
d) Final report submitted	X
If b), c) or d), was your report submitted:	
by the original deadline of 1.1.98 (Decision III/9)?	X
by the extended deadline of 31.12.98 (Decision IV/14)?	
Later (please specify date)	

Decision IV/14 National reports

302. Did all relevant stakeholders participate in the preparation of this national report, or in the compilation of information used in the report?	
a) no	
b) yes	X
303. Has your country taken steps to ensure that its first and/or second national report(s) is/are available for use by relevant stakeholders?	
a) no	
b) yes	X
If yes, was this by:	
a) informal distribution?	X
b) publishing the report?	X
c) making the report available on request?	X
d) posting the report on the Internet?	X

Decision V/19. National reporting

304. Has your country prepared voluntary detailed thematic reports on one or more of the items for in-depth consideration at an ordinary meeting of the parties, following the guidelines provided?	
a) no	X
b) yes – forest ecosystems	
c) yes – alien species	
d) yes – benefit sharing	

Decision V/6. Ecosystem approach

305. Is your country applying the ecosystem approach, taking into account the principles and guidance contained in the annex to decision V/6?	
a) no	
b) under consideration	X
c) some aspects are being applied	
d) substantially implemented	
306. Is your country developing practical expressions of the ecosystem approach for national policies and legislation and for implementation activities, with adaptation to local, national, and regional conditions, in particular in the context of activities developed within the thematic areas of the Convention?	
a) no	
b) under consideration	
c) some aspects are being applied	X
d) substantially implemented	
307. Is your country identifying case studies and implementing pilot projects that demonstrate the ecosystem approach, and using workshops and other mechanisms to enhance awareness and share experience?	
a) no	
b) case-studies identified	
c) pilot projects underway	
d) workshops planned/held	X
e) information available through CHM	
308. Is your country strengthening capacities for implementation of the ecosystem approach, and providing technical and financial support for capacity-building to implement the ecosystem approach?	
a) no	
b) yes within the country	X
c) yes including support to other Parties	
309. Has your country promoted regional co-operation in applying the ecosystem approach across national borders?	
a) no	
b) informal co-operation	
c) formal co-operation (please give details)	X
E.g. by establishing transborder protected areas (Romanian-Ukrainian Biosphere	

Reserve "Danube Delta", etc)

Inland water ecosystems

Decision IV/4. Status and trends of the biological diversity of inland water ecosystems and options for conservation and sustainable use

310. Has your country included information on biological diversity in wetlands when providing information and reports to the CSD, and considered including inland water biological diversity issues at meetings to further the recommendations of the CSD?	
a) no	
b) yes	X
311. Has your country included inland water biological diversity considerations in its work with organizations, institutions and conventions affecting or working with inland water?	
a) no	
b) yes	X
If a developing country Party or Party with economy in transition – 312. When requesting support for projects relating to inland water ecosystems from the GEF, has your country given priority to identifying important areas for conservation, preparing and implementing integrated watershed, catchment and river basin management plans, and investigating processes contributing to biodiversity loss?	
a) no	
b) yes	X
313. Has your country reviewed the programme of work specified in annex 1 to the decision, and identified priorities for national action in implementing the programme?	
a) no	
b) under review	X
c) yes	

Decision V/2. Progress report on the implementation of the programme of work on the biological diversity of inland water ecosystems (implementation of decision IV/4)

314. Is your country supporting and/or participating in the River Basin Initiative?	
a) no	
b) yes	X
315. Is your country gathering information on the status of inland water biological diversity?	
a) no	
b) assessments ongoing	X
c) assessments completed	
316. Is this information available to other Parties?	
a) no	
b) yes - national report	X

c) yes – through the CHM	
d) yes – other means (please give details below)	X (Scientific publications)
317. Has your country developed national and/or sectoral plans for the conservation and sustainable use of inland water ecosystems?	
a) no	
b) yes – national plans only	X
c) yes – national plans and major sectors	
d) yes – national plans and all sectors	
318. Has your country implemented capacity-building measures for developing and implementing these plans?	
a) no	X
b) yes	

Decision III/21. Relationship of the Convention with the CSD and biodiversity-related conventions

319. Is the conservation and sustainable use of wetlands, and of migratory species and their habitats, fully incorporated into your national strategies, plans and programmes for conserving biological diversity?	
a) no	X
b) yes	

Further comments on implementation of these decisions and the associated programme of work

A concept (strategy) for preserving wetlands has been developed. Today under the Ramsar Convention there are 700 thousand hectares of wetlands of international importance in Ukraine. An international program (involving Belarus, Ukraine and Russia) is under activity for enhancing the environment of the river Dnipro (supported by GEF).

Marine and coastal biological diversity

Decision II/10 and Decision IV/5. Conservation and sustainable use of marine and coastal biological diversity

320. Does your national strategy and action plan promote the conservation and sustainable use of marine and coastal biological diversity?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
321. Has your country established and/or strengthened institutional, administrative and legislative arrangements for the development of integrated management of marine and coastal ecosystems?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) arrangements in place	
322. Has your country provided the Executive Secretary with advice and information	

on future options concerning the conservation and sustainable use of marine and coastal biological diversity?	
a) no	X
b) yes	
323. Has your country undertaken and/or exchanged information on demonstration projects as practical examples of integrated marine and coastal area management?	
a) no	X
b) yes – previous national report	
c) yes - case-studies	
d) yes - other means (please give details below)	
324. Has your country programmes in place to enhance and improve knowledge on the genetic structure of local populations of marine species subjected to stock enhancement and/or sea-ranching activities?	
a) no	
b) programmes are being developed	X
c) programmes are being implemented for some species	
d) programmes are being implemented for many species	
e) not a perceived problem	
325. Has your country reviewed the programme of work specified in an annex to the decision, and identified priorities for national action in implementing the programme?	
a) no	
b) under review	X
c) yes	
323. TACIS project and GEF feasibility study	

Decision V/3. Progress report on the implementation of the programme of work on marine and coastal biological diversity (implementation of decision IV/5)

326. Is your country contributing to the implementation of the work plan on coral bleaching?	
a) no	
b) yes	
c) not relevant	X
327. Is your country implementing other measures in response to coral bleaching?	
a) no	
b) yes (please provide details below)	
c) not relevant	X
328. Has your country submitted case-studies on the coral bleaching phenomenon to the Executive Secretary?	
a) no	
b) yes	
c) not relevant	X

Agricultural biological diversity

Decision III/11 and Decision IV/6. Conservation and sustainable use of agricultural biological diversity

329. Has your country identified and assessed relevant ongoing activities and existing instruments at the national level?	
a) no	
b) early stages of review and assessment	X
c) advanced stages of review and assessment	
d) assessment completed	
330. Has your country identified issues and priorities that need to be addressed at the national level?	
a) no	
b) in progress	X
c) yes	
331. Is your country using any methods and indicators to monitor the impacts of agricultural development projects, including the intensification and extensification of production systems, on biological diversity?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) mechanisms in place	
332. Is your country taking steps to share experiences addressing the conservation and sustainable use of agricultural biological diversity?	
a) no	
b) yes – case-studies	X
c) yes – other mechanisms (please specify)	
333. Has your country conducted case-studies on the issues identified by SBSTTA: i) pollinators, ii) soil biota, and iii) integrated landscape management and farming systems?	
a) no	
b) yes – pollinators	X
c) yes – soil biota	X
d) yes – integrated landscape management and farming systems	X
334. Is your country establishing or enhancing mechanisms for increasing public awareness and understanding of the importance of the sustainable use of agrobiodiversity components?	
a) no	
b) early stages of development	X
c) advanced stages of development	
d) mechanisms in place	
335. Does your country have national strategies, programmes and plans which ensure the development and successful implementation of policies and actions that lead to sustainable use of agrobiodiversity components?	

a) no	
b) early stages of development	X
c) advanced stages of development	
d) mechanisms in place	
336. Is your country promoting the transformation of unsustainable agricultural practices into sustainable production practices adapted to local biotic and abiotic conditions?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
337. Is your country promoting the use of farming practices that not only increase productivity, but also arrest degradation as well as reclaim, rehabilitate, restore and enhance biological diversity?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
338. Is your country promoting mobilization of farming communities for the development, maintenance and use of their knowledge and practices in the conservation and sustainable use of biological diversity?	
a) no	
b) yes - limited extent	X
c) yes - significant extent	
339. Is your country helping to implement the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources?	
a) no	
b) yes	X
340. Is your country collaborating with other Contracting Parties to identify and promote sustainable agricultural practices and integrated landscape management?	
a) no	
b) yes	X

Decision V/5. Agricultural biological diversity: review of phase I of the programme of work and adoption of a multi-year work programme

341. Has your country reviewed the programme of work annexed to the decision and identified how you can collaborate in its implementation?	
a) no	
b) yes	X
342. Is your country promoting regional and thematic co-operation within this framework of the programme of work on agricultural biological diversity?	
a) no	
b) some co-operation	X
c) widespread co-operation	
d) full co-operation in all areas	
343. Has your country provided financial support for implementation of the programme of work on agricultural biological diversity?	

a) no	
b) limited additional funds	X
c) significant additional funds	
If a developed country Party –	
344. Has your country provided financial support for implementation of the programme of work on agricultural biological diversity, in particular for capacity building and case-studies, in developing countries and countries with economies in transition?	
a) no	
b) yes within existing cooperation programme(s)	
b) yes, including limited additional funds	
c) yes, with significant additional funds	
345. Has your country supported actions to raise public awareness in support of sustainable farming and food production systems that maintain agricultural biological diversity?	
a) no	
b) yes, to a limited extent	X
c) yes, to a significant extent	
346. Is your country co-ordinating its position in both the Convention on Biological Diversity and the International Undertaking on Plant Genetic Resources?	
a) no	
b) taking steps to do so	X
c) yes	
347. Is your country a Contracting Party to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade?	
a) not a signatory	
b) signed – ratification in process	
c) instrument of ratification deposited	X
348. Is your country supporting the application of the Executive Secretary for observer status in the Committee on Agriculture of the World Trade Organisation?	
a) no	
b) yes	X
349. Is your country collaborating with other Parties on the conservation and sustainable use of pollinators?	
a) no	
b) yes	X
350. Is your country compiling case-studies and implementing pilot projects relevant to the conservation and sustainable use of pollinators?	
a) no	X
b) yes (please provide details)	
351. Has information on scientific assessments relevant to genetic use restriction technologies been supplied to other Contracting Parties through media such as the Clearing-House Mechanism?	
a) not applicable	

b) no	
c) yes - national report	
d) yes – through the CHM	
e) yes – other means (please give details below) *by scientific publications*	X
352. Has your country considered how to address generic concerns regarding such technologies as genetic use restriction technologies under international and national approaches to the safe and sustainable use of germplasm?	
a) no	
b) yes – under consideration	X
c) yes – measures under development	
353. Has your country carried out scientific assessments on inter alia ecological, social and economic effects of genetic use restriction technologies?	
a) no	
b) some assessments	X
c) major programme of assessments	
354. Has your country disseminated the results of scientific assessments on inter alia ecological, social and economic effects of genetic use restriction technologies?	
a) no	
b) yes – through the CHM	
c) yes – other means (please give details below) *by scientific publications*	X
355. Has your country identified the ways and means to address the potential impacts of genetic use restriction technologies on the in situ and ex situ conservation and sustainable use, including food security, of agricultural biological diversity?	
a) no	
b) some measures identified	X
c) potential measures under review	
d) comprehensive review completed	
356. Has your country assessed whether there is a need for effective regulations at the national level with respect to genetic use restriction technologies to ensure the safety of human health, the environment, food security and the conservation and sustainable use of biological diversity?	
a) no	
b) yes – regulation needed	X
c) yes – regulation not needed (please give more details)	
357. Has your country developed and applied such regulations taking into account, inter alia, the specific nature of variety-specific and trait-specific genetic use restriction technologies?	
a) no	
b) yes – developed but not yet applied	X
c) yes – developed and applied	
358. Has information about these regulations been made available to other Contracting Parties?	

a) no	
b) yes – through the CHM	
c) yes – other means (please give details below)*by scientific publications*	X

Further comments on implementation of these decisions and the associated programme of work

Ukraine takes steps to share experiences on the conservation and sustainable use of agricultural biological diversity; however the country is at the early stage of this process. On the base of Institute of Agroecology and Biotechnology of Ukrainian Academy of Agricultural Sciences there was implicated a special research project for complex investigations of main factors (biotic and abiotic ones) of local agroecosystems, which could be used to transformation of unsustainable agricultural practices into sustainable production practices adapted to local biotic and abiotic conditions. There are many scientific institutes in Ukraine, in which new biotechnological methods including restriction technologies are worked out. Also, the methods have been developed for assessment of the safety of them for human health, for the environment, conservation and sustainable use of biological diversity. Unfortunately, Ukrainian needs in this field do no match with financial opportunities.

The COP has established programmes of work that respond to a number of Articles.

Further comments on implementation of these decisions and the associated programme of work

Forest biological diversity

Decision II/9 and Decision IV/7. Forest biological diversity

359. Has your country included expertise on forest biodiversity in its delegations to the Intergovernmental Panel on Forests?	
a) no	
b) yes	X
c) not relevant	
360. Has your country reviewed the programme of work annexed to the decision and identified how you can collaborate in its implementation?	
a) no	
b) under review	X
c) yes	
361. Has your country integrated forest biological diversity considerations in its participation and collaboration with organizations, institutions and conventions affecting or working with forest biological diversity?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
362. Does your country give high priority to allocation of resources to activities that advance the objectives of the Convention in respect of forest biological diversity?	

a) no	
b) yes	X
For developing country Parties and Parties with economies in transition - 363. When requesting assistance through the GEF, Is your country proposing projects which promote the implementation of the programme of work?	
a) no	
b) yes	X

Decision V/4. Progress report on the implementation of the programme of work for forest biological diversity

364. Do the actions that your country is taking to address the conservation and sustainable use of forest biological diversity conform with the ecosystem approach?	
a) no	
b) yes	X
365. Do the actions that your country is taking to address the conservation and sustainable use of forest biological diversity take into consideration the outcome of the fourth session of the Intergovernmental Forum on Forests?	
a) no	
b) yes	X
366. Will your country contribute to the future work of the UN Forum on Forests?	
a) no	
b) yes	X
367. Has your country provided relevant information on the implementation of this work programme?	
a) no	
b) yes – submission of case-studies	X
c) yes – thematic national report submitted	
d) yes – other means (please give details below)	
368. Has your country integrated national forest programmes into its national biodiversity strategies and action plans applying the ecosystem approach and sustainable forest management?	
a) no	
b) yes – limited extent	X
c) yes – significant extent	
369. Has your country undertaken measures to ensure participation by the forest sector, private sector, indigenous and local communities and non-governmental organisations in the implementation of the programme of work?	
a) no	
b) yes – some stakeholders	X
c) yes – all stakeholders	
370. Has your country taken measures to strengthen national capacities including local capacities, to enhance the effectiveness and functions of forest protected area networks, as well as national and local capacities for implementation of sustainable forest management, including restoration?	
a) no	

b) some programmes covering some needs	
c) many programmes covering some needs	X
d) programmes cover all perceived needs	
e) no perceived need	
371. Has your country taken measures to implement the proposals for action of the Intergovernmental Forum on Forests and the Intergovernmental Panel on Forests on valuation of forest goods and services?	
a) no	
b) under consideration	X
c) measures taken	

Biological diversity of dry and sub-humid lands

Decision V/23. Consideration of options for conservation and sustainable use of biological diversity in dryland, Mediterranean, arid, semi-arid, grassland and savannah ecosystems

372. Has your country reviewed the programme of work annexed to the decision and identified how you will implement it?	
a) no	
b) under review	X
c) yes	
373. Is your country supporting scientifically, technically and financially, at the national and regional levels, the activities identified in the programme of work?	
a) no	
b) to a limited extent	X
c) to a significant extent	
374. Is your country fostering cooperation for the regional or sub-regional implementation of the programme among countries sharing similar biomes?	
a) no	
b) to a limited extent	X
c) to a significant extent	

Decision V/20. Operations of the Convention

375. Does your country take into consideration gender balance, involvement of indigenous people and members of local communities, and the range of relevant disciplines and expertise, when nominating experts for inclusion in the roster?	
a) no	
b) yes	X
376. Has you country actively participated in sub-regional and regional activities in order to prepare for Convention meetings and enhance implementation of the Convention?	
a) no	
b) to a limited extent	X
c) to a significant extent	
377. Has your country undertaken a review of national programmes and needs related to the implementation of the Convention and, if appropriate, informed the Executive Secretary?	
a) no	
b) under way	X
c) yes	

Please use this box to identify what specific activities your country has carried out as a DIRECT RESULT of becoming a Contracting Party to the Convention, referring back to previous questions as appropriate:

Since Ukraine ratified the CBD (1994) the Ministry of Environment and Natural Resources of Ukraine and many other state and private owned organisations became to pay much more attention to and work increasingly, nationally and internationally, with biodiversity related issues.

The work was being directed mainly to the development of nature conservation policy for the protection and sustainable use of biological diversity as defined in the CBD and taking into account national priorities and implementation of practical steps towards conservation of biodiversity. There is no a special law on conservation and sustainable use of biodiversity in Ukraine, but currently all corresponding issues are regulated by other active laws.

The "Principal Directions of State Policy of Ukraine on Environment Protection, Use of Natural Resources and Ensuring Ecological Safety", adopted by Verkhovna Rada of Ukraine in 1998 defined as a priority the creation of balanced system of use of the environment with an adequate structural change in production potentials. The CBD initiated development of National Report, Strategy and National Program on Biodiversity: projects GEF/CBD "Preparation of Biodiversity Strategy and Action Plan (BSAP) and National Report" and "Preparation of Biodiversity Phase II Enabling Activity". Implementation of CBD and relevant decisions and provisions simulated development and adoption of a number of new laws and updating the existing laws. E.g., the following laws of Ukraine were developed or updated: "On the Protection of Environment" (1991, 2000) and "On the Natural Reserve Fund of Ukraine" (1992, 2002), "On hunting (2000), "On the Plant Kingdom" (1999), "On Animal Kingdom", "On the Moratorium on Entire Felling at the Mountainsides in Fir-Copper Beech Forests in Carpathian Region" (2000), "On accession to the Cartagena Protocol "On Biosafety of GMOs and Products Thereof" (2002), "On the State Program of Ukraine's National Environmental Network Development for Years 2000-2015" (2000), "On the Red Book of Ukraine" (2002) and the Forestry Code (1994).

In 1999 the Resolution of the Cabinet of Ministers of Ukraine "Provisions on National Wetlands" was approved. The Resolution determined the single criteria of evaluation of the territories and a procedure for acknowledging them as wetlands of national importance, conditions of their protection and management. A great number of new protected areas have been established. Territories and objects of the Nature Protected

Area Fund of Ukraine are considered to be elements of the National ecological network of Ukraine, the development of which was started in 1999.

Various aspects of biodiversity became themes of scientific research in institutes of National Academy of Science of Ukraine and universities.

Numerous projects have been implemented in the nature. Some of them, in particular GEF/World Bank's projects were mentioned above in the Report.

The provisions of the Convention and the decisions of the Conferences of Parties have facilitated Ukrainian activity aimed at the conservation and sustainable use of biodiversity.

Please use this box to identify joint initiatives with other Parties, referring back to previous questions as appropriate:

Ukraine has established or is establishing transboundary nature protected areas with Romania, Russia, Moldova, Poland and Slovak Republic. Collaboration of Ukraine , Poland and Russia has been going on in development of the GEF project "Biodiversity Conservation in the Trans-frontier Galytsko-Slobozhansky Corridor", which will put the first step towards integration of three countries in Pan-European Econetwork.

If your country has completed its national biodiversity strategy and action plan (NBSAP), please give the following information:

Date of completion:	1998
If the NBSAP has been adopted by the Government	
By which authority?	*Cabinet of Ministry of Ukraine*
On what date?	*Strategy - on May 12,1997* *Draft law of Ukraine "On National programme on Protection Biodiversity for 1998-2015"(Action Plan) - on September 7, 1998*
If the NBSAP has been published please give	
Title:	***"National Report of Ukraine on Conservation of Biological Diversity"*** *in English and Ukrainian* ***"Strategy of Conservation of Ukraine's Biological Diversity"*** *in English and Ukrainian*
Name and address of publisher:	*"Prospect Ltd" "Taki Spravy", Kyiv 1997*
ISBN:	*966-95231-1-7*
Price (if applicable):	
Other information on ordering:	*The documents may be requested through the National Focal Point or Interecocentre (details are at the beginning of the Report)*
If the NBSAP has not been published	
Please give full details of how copies can be obtained:	*The documents may be requested through the National Focal Point or Interecocentre (details are at the beginning of the Report)*
If the NBSAP has been posted on a national website	
Please give full URL:	*See the CBD's web-site*
If the NBSAP has been lodged with an Implementing Agency of the GEF	
Please indicate which agency:	*World Bank*

Has a copy of the NBSAP been lodged with the Convention Secretariat?			
Yes	X	No	

Please provide similar details if you have completed a Biodiversity Country Study or another report or action plan relevant to the objectives of this Convention

In 2000 the National report on the State of Environment of Ukraine was published by the Ministry of Environment and Natural Resources of Ukraine including relevant data on protection and sustainable use of biological diversity.

The "IBA's of Ukraine", "National Action Plans for Globally Threatened Species" (2000), "National Report for IBA's of Ukraine" (1999, 2000, 2001) were developed.

In the frame of the grant for the "Preparation of Biodiversity Phase II Enabling Activity Project" received by Ukraine from the GEF through the World Bank (2001-2003), the assessment of implementation by Ukraine a few CBD's articles has been done. The outputs are to be used by the Government to reconsider the current legislation related to biodiversity and promote further implementation of CBD.

Please provide details of any national body (e.g. national audit office) that has or will review the implementation of the Convention in your country

Ministry of the Environment and Natural Resources of Ukraine

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Editors: Dr. S. Gubar, Yu. Kolmaz, V. Solomakha, S. Mosyakin.
Reviewers: Prof. Dr. A. Hrytsenko, Dr. P. Moroz.

For preparing the Second National Report "Biodiversity Conservation in Ukraine", the following sources of information were used: Resolution of the Cabinet of Ministers of Ukraine No 439 of 12.05.1997 (Bulletin of the Verkhovna Rada of Ukraine, 1997), National Report on the Biodiversity Conservation in Ukraine (Minecosafety of Ukraine, Kyiv, 1997), National Report on the State of Environment of Ukraine in 1997 (Minecosafety of Ukraine, Kyiv, 1998); National Report on the State of Environment of Ukraine in 1998 (Minecosafety of Ukraine, Kyiv, 1999); National Report on the State of Environment of Ukraine in 1999 (Ministry of the Environment and Natural Resources of Ukraine, Kyiv, 2000); National Report on the State of Environment of Ukraine in 2000 (Ministry of the Environment and Natural Resources of Ukraine, Kyiv, 2001); National Report on the State of Environment of Ukraine in 2001 (Ministry of the Environment and Natural Resources of Ukraine, Kyiv, 2002); State Programme of Ukraine's National Ecological network Development for Years 2000-2015 (Law of Ukraine of 21/09/2000 No 1989-III// Bulletin of the Verkhovna Rada of Ukraine, 2000), State Programme of the Protection and Rehabilitation of the Azov-Black Seas Environment (Law of Ukraine of 22.03.2001 No 2333-III//Bulletin of the Verkhovna Rada of Ukraine, 2001), Biodiversity Conservation: Traditions and the Present (Ed. by Dr. T. Hardashuk. Kyiv, 2003); Convention on Biodiversity and Legal Base for its Implementation in Ukraine (Ed. by Dr. N.Malysheva. Kyiv, 2003); Conservation and Sustainable Use of Biodiversity of Ukraine: State, Future Prospects and Measures (Ed. by Dr. Yu. Sheliag-Sosonko. Kyiv, 2003); Evaluation and Mitigation of the Treat to Biodiversity in Ukraine (Ed. by Dr. O. Dudkin. Kyiv, 2003); Future Prospects of the Use, Conservation and Restoration of Agrobiodiversity in Ukraine (Ed. by Dr. V. Patyka and Dr. V. Solomakha. Kyiv, 2003).

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Preface

At the end of the second millennium and at the beginning of the third millennium, the humankind is facing the threat of losing the integrity of the biosphere as the global ecosystem of our planet. It is caused by human activities and appears in natural disasters, such as floods, draughts, and fires, which now affect the planet repeatedly and rather frequently. According to archive materials, only 12 cases of severe floods has been registered in the Ukrainian Carpathians from 1700 until 1940; and for the last 60 years, there were at least 18 floods. No doubt, these ecological cataclysms are not accidental: they are caused, at least partially, by human activities.

Destruction of the plant cover and pollution of the environment disturb the dynamic balance of the atmosphere, which results in the ozone layer depletion, decreased ability of the atmospheric self-rehabilitation from pollutants, in particular methane, and activation of global warming processes. The positive feedback effect and cumulative effect play the main role in intensifying these processes. Thus, deforestation leads to accumulation of large amounts of methane and carbon dioxide in the atmosphere and therefore leads to the greenhouse effect, smog formation, and depletion of the ozone layer in the stratosphere and, furthermore, to suppression of the photosynthetic capacity. Finally it causes changes in directions and strength of winds, spatial redistribution of atmospheric precipitation, floods and draughts, and intensified desertification processes. These factors taken integrally cause losses of biodiversity and extinction or extirpation of endemic, relict, rare and threatened species of animals and plants, which, in turn, leads to reduction of general bioproductivity of ecosystems, often with simultaneous invasions of alien species.

Natural ecosystems underwent the most dramatic changes and deterioration. Some of these ecosystems disappeared forever, and the majority has been transformed into the variously altered or disturbed ecosystems. It is supposed that 65% of the Earth ecosystems in 2000 suffered from various stages of degradation, and only 35% of those are still preserved in their natural conditions. In Ukraine the present state of ecosystems from the viewpoint of their naturalness is even much worse. In the 1st century AD, forests occupied 55% of Ukraine's total area (in modern boundaries), steppes – 32%, wetlands and floodplains – 5%, salt marshes – 1.5%, and only the area of meadows increased up to 9%. It means that changes in natural components of the territory were severely altered. By the end of the 20th century the area covered by natural vegetation in the world constituted 1.8 ha per capita, while in Ukraine – only 0.36 ha per capita (including forests – less than 0.2 ha per capita). Currently Ukraine has the worst indicator in Europe concerning plowing lands (arable lands cover 54% of Ukraine's territory), with enormously high areas of eroded lands and those under the threat of erosion (ca. 83% of agricultural areas).

However, because of its geographical position Ukraine is rich in the living nature, which is represented, within a relatively small territory from north to south, by the biota of four natural zones: broadleaf forests, forest-steppe, steppe, and mediterranean-type zones. The boundary between broadleaf forests of the Eastern and Central European provinces is located in Ukraine. Moreover, Ukraine, which occupies less than 6% of Europe, possesses more than 35% of Europe's biodiversity, being by this index far ahead of almost all European countries, except France famous for its rich biological diversity. –It

is partly explained by the fact that Ukraine is located on the crossroad of historically different migration waves of plants and animals from different centers of origin, the migrations that passed through our territory leaving here its living traces and memorials.

Despite the great attention to biodiversity conservation, the process leading to biodiversity losses is still continuing in the world, which is especially dangerous for the biodiversity components sensitive or vulnerable to human impacts, changes of climatic factors or ecological parameters of habitats. Nowadays more than 26 thousand species of plants, animals, and fungi are globally under the threat of extinction, including 933 species in Ukraine. At the same time, the processes of biotic invasion of alien species in natural and disturbed habitats sufficiently gain momentum and scope.

Considering the dangerous situation in biodiversity conservation in the world in general and in Ukraine in particular, the concerns of scientists, general public, and governmental institutions regarding the necessity to halt the biodiversity losses in Ukraine, to implement a system for the sustainable use of nature and maximal restoration of its biotic components as a main natural resource.

CHAPTER 1. BIODIVERSITY ON UKRAINE: GENERAL CHARACTERISTICS, THREATS AND TRENDS

1.1 Biodiversity in Ukraine: general characteristics

The geographical location of Ukraine, its physiographic peculiarities conditioned the formation of the rich flora and fauna consisting of about 70 thousand species. Since the publication of the first National Report of Ukraine on Biodiversity Conservation (1997), due to the research of botanists and mycologists, additional data have been obtained regarding the patterns of diversity of plants and fungi of Ukraine. At present, vascular plants is the best studied group among all taxonomic groups of plants and fungi occurring in Ukraine; however, there are still some problematic taxa with an uncertain taxonomic status. 6086 plant species are included in the recently published nomenclatural checklist of vascular plants of Ukraine (Mosyakin, Fedoronchuk, 1999). Of them, 5310 are aboriginal and unintentionally introduced, 226 are cultivated and naturalized, 533 are mostly widely cultivated species, and the presence of 126 species in the flora of Ukraine needs confirmation.

In addition to vascular plants, the flora of Ukraine contains non-vascular plants, fungi, lichens (lichenized fungi) and many other diverse groups of organisms (e.g., prokaryotic cyanobacteria and various photosynthetic protists) that were traditionally treated as "plants". Bryophytes (mosses, liverworts and hornworts) are represented by 763 species (Danylkiv et al., 1995; Virchenko, 2000, 2002; Virchenko, Vanya, 2000). The algal flora contains at least of 4908 species and 6101 infraspecific taxa of algae and algae-like organisms (Wasser, Tsarenko (eds.) et al., 2000; Tsarenko, Petlyovany, 2001).

Fungi are less studied in terms of their overall taxonomic diversity in Ukraine. At present, at least 5227 fungal species are reported from Ukraine (Fungi of Ukraine. A Preliminary Checklist, 1996), and the estimated actual number of species of fungi and

fungi-like organisms could exceed 15,000. An annotated checklist of lichens (including lichen-forming, lichenicolous and allied fungi) includes 1322 species (Kodratyuk et al., 1998).

The fauna of Ukraine contains over 45 thousand species, which belong to two systematic groups of the highest rank – vertebrates and invertebrates, and the number of invertebrate species is, of course, much higher than the number of vertebrates.

According to the approximate estimates, 1/3 of species actually occurring in Ukraine, fungi and insects in particular, have not yet been described or reported for the country.

511 species of plants and 382 species of animals are listed in the second edition of the Red Data Book of Ukraine. A useful index of the level of preservation of the floral and faunal diversity is the parameter reflecting preservation of rare species. Based on the number of preserved globally endangered species of Europe, Ukraine occupies the fifth position. Therefore, there is a considerable potential for biodiversity conservation and restoration; i.e., our country can be considered as one of the important reservoirs and hotspots for biodiversity restoration for whole Europe.

The geographical location, orographic and climatic peculiarities of Ukraine have contributed to the formation of a diverse vegetation, patterns of which regularly change from north to south according to four natural zones: broad-leaved forest (including Polissia, or Polissya), forest-steppe, steppe, and Mediterranean forest. The mountain systems in Ukraine are represented by the Ukrainian Carpathians and the Crimean Mountains.

Vegetation of Ukrainian Polissia is represented mostly by pine and oak-pine forests on sandy and sandy-loamy soddy-podzolic soils. Oak-hornbeam and oak forests (on the richest varieties of soddy-podzolic soils) occur less frequently, and alder trees grow under the most humid conditions. Rather considerable are the areas of meadows concentrated on floodplains. Mires occur mostly in floodplain areas and in upper reaches of small and medium-size rivers, as well as in relict river valleys. The most widespread mire types are lowland (eutrophic) mires, less frequent are acid (oligotrophic) and transitional (mesotrophic) bogs and mires, which are formed in relict valleys and interfluves.

The flora of the western part of the broad-leaved forest zone is characterized by the prevalence of oak, hornbeam-oak, and beech forests on light gray podzolic soils. Swamps and mires occur less frequently than in Polissia, and their vegetation is rather specific. On the southern slopes, rarely occur patches of meadow steppes with dominance of the mesophytic species of feather-grass (species of *Stipa*) and sedge (*Carex humilis*).

Forests also prevail in the Carpathians. The types of forests change according to their altitudinal zonality. The lowest zone of foothills is formed by oak and oak-hornbeam forests, and somewhere, in the northeastern part of the Carpathians, by beech forests. The main stands of beech forests grow mostly in the lower forest zone reaching on the southwestern macroslope the altitude of 1400 meters above sea level. They occupy totally about 1/3 of the forest-covered area of the Carpathians, and mountain coniferous (fir and spruce) forests, about 1/2. The latter form the upper mountain forest zone. On the places of destroyed forests the post-forest meadows have been formed, which now occupy about 1/3 of the area of the upper forest zone. The subalpine zone extends upward from 1800 meters above sea level. Its vegetation is represented by beech and spruce krummholz (elfinwood, forests of stunted trees near the timberline), as well as shrubbery of mugho pine (*Pinus mugo*) and green alder (*Alnus*

alnobetula = Alnus viridis), and subalpine meadows. Alpine vegetation is represented by high-mountain meadows and petrophilic plant communities; it occurs fragmentarily, only on the highest peaks.

The forest-steppe zone occupies about 1/3 of the territory of Ukraine, and, despite the considerable anthropogenic pressure, there is still a diverse vegetation within this zone, in particular: forests formed by oak (oak, hornbeam-oak, lime-tree–oak, durmast oak (in the southwestern part of forest-steppe), and hornbeam. Pine and oak-pine forests occur on sandy soils of the second terrace of the Dnipro DniproRiver and its left-bank tributaries. Meadow vegetation is formed within floodplains of rivers. Mires and other wetlands are also restricted to floodplains of rivers and are mostly represented by high-grass eutrophic variants. Steppe vegetation (mostly meadow -forb (motley) steppes) is preserved only as small fragments on the areas unsuitable for ploughing and intensive use and on protected areas of the Nature Conservation Fund.

The steppe zone occupies about 40% of the territory of Ukraine and is subjected to the strongest anthropogenic pressure upon its vegetation. In the past, there prevailed true fescue-feathergrass-forb and fescue-feathergrass steppes, as well as petrophilic and psammophilic variants. Today they remain on less than 3% of the territory. Oak forests occur in some areas of floodplains of steppe rivers, steep slopes and ravines. Meadows are confined to floodplains of large rivers and to so-called "*pody*" (vernal pools, large but shallow drainless depressions on interfluves). Lower reaches of long rivers (the Danube, the Dnipro, the Northern Bug, etc.) are occupied by the typical "*plavni*" vegetation, which is represented by a complex of aquatic, riverside-aquatic, swamp, and floodplain forest plant communities. Vegetation of sandy and coquina spits of the Sea of Azov is represented by littoral associations and is also specific. The steppe zone also has halophytic plant communities, though occupying small areas.

The Mediterranean forest zone (Mountain Crimea) has the richest vegetation. Specific vegetation belts are formed depending on changes of climatic factors according to altitudinal zones. The northern macroslope is occupied by the forest-steppe zone (durmast oak forests, pistachio forest stands, and Pontic steppes), oak forests (durmast and pubescent oak forests), beech and hornbeam forests. On the southern macroslope - *shibliak* thickets (plant communities similar to Mediterranean *maquis*) formed by pubescent oak and eastern hornbeam, rarified forests stands of juniper (*Juniperus excelsa*), and xerophytic herbaceous vegetation of a savannoid type. Higher the zone of Crimean pine forests is located, which is gradually replaced by durmast oak, and, at altitudes of 750-800 meters above sea level, by beech. The flat mountaintops (plateaus) of the Crimean Mountains (so-called *yaila*) are covered with meadow and petrophilic steppes, tomillars (low-grown Mediterranean scrub), and occasionally true meadows.

In general, the plant cover of Ukraine is represented by forests, meadows, mires, steppes, tomillars, shrubbery, halophilous, psammophilous, calcephilous, cretophilous, petrophilous and aquatic plant associations. The cenofund (phytosociological composition) of Ukraine (based on data of 1991) contains over 3800 associations and 1100 variants of associations united in 348 formations (Prodromus of vegetation of Ukraine, 1991). Scientists of the M.G. Kholodny Institute of Botany of the National Academy of Sciences of Ukraine recently conducted an inventory of cenotaxonomic diversity and developed its synphytosozological classification. Such activities have been completed for the forest flora. According to the data of Yu.R. Shelyag-Sosonko et al. (2002), the cenofund of the Ukrainian Carpathians comprise 801 associations belonging to 16 formations; that of Ukrainian Polissia, 409

associations of 10 formations; the Podolian (Podillya) part of the forest zone, 246 associations of 12 formations; the forest-steppe zone, 405 associations of 13 formations, and the steppe zone, 380 associations of 18 formations. In the Mountain Crimea, the cenofund of forests is represented by 278 associations belonging to 13 formations.

Using methods of synphytosozological evaluation of the cenofund developed at the Geobotany Department of the M.G. Kholodny Institute of Botany of the National Academy of Sciences of Ukraine, there have been defined 373 rarest forest associations of 23 formations, which belong to type I of the synphytosozological classification. In the Ukrainian Carpathians, 169 such rare associations have been identified: in Ukrainian Polissia – 16, in Forest Podolia (Podillya) – 47, in Forest-Steppe – 16, and in Steppe – 98. All these associations should be included in the new edition of the Green Data Book of Ukraine.

Identification of the rare cenofund of vegetation of Ukraine will ensure solving a number of issues in forest preservation; in particular, developing modes and approaches of their protection, supporting their phytogenetic potential, formation of biologically stable associations, stabilization of the environment in the regions, and so forth. The cenofund of Ukraine is its national heritage.

1.2 Evaluation of specific threats to components of biodiversity and mitigation of adverse impacts

1.2.1 Methodology of evaluation of biodiversity and threats to its components

For analyzing biodiversity, following main biodiversity components can be conventionally recognized:

- genetic diversity of populations;
- species diversity of the biota;
- structural and functional diversity of ecosystems, biogeocenoses, and the biosphere.

The purpose of this conceptual subdivision of biodiversity by various levels of organization or by components is to identify the targets of threats and measures for neutralizing specific threat, or reduction of adverse consequences.

Before the introduction of the biodiversity concept, the main attention was paid to genetic resources preservation, i.e., protection of species and genetic diversity in populations. The new concept takes into account all levels of organization of the biosphere, and poses the task assessing threats not only to species and populations, but also to the whole ecosystems. It needs their typification, classification, and inventory. However, there are no conventional productive conceptual approaches to resolving these problems, and, therefore, there are no appropriate specific mechanisms of influencing the ecosystems. Because of that, the population, being the elementary evolutionary unit, is the main subject of impacts upon biodiversity and a unit of biodiversity assessment for preservation on genetic, population-specific, and ecosystemic levels. It is effected by the important role of the population as a structural and functional homeostasis element in any ecosystem. Such approach is conventional in the world practice, as at present in most cases the species diversity of the biota is meant.

The term “threat”, which is frequently used in considering problems of environmental safety, reflects the possibility of occurrence of certain technical, economic, and social conditions that can cause unfavorable events and processes (for example, technogenic catastrophes at industrial enterprises, natural disasters, economic or social crises, etc.). The following definition of the term “threat” is frequently used in the literature: “It is a natural or technogenic phenomenon with forecasted but uncontrolled events that can in at some moment within the given territory bring harm to human health, cause material or financial losses, or adversely affect the environment”. It is necessary to note that no available definition of the term “threat” directly emphasize the biodiversity concept.

The Convention on Biological Diversity (CBD) also does not contain a clear definition of the term “threat to biodiversity”. Therefore, generally

speaking, dangerous for biodiversity are considered only rapid irreversible changes caused by various anthropic activities that are beyond the self-restoration capacity of living matter. A threat can refer to different components of biodiversity but not all threats can be reliably identified, corrected, and monitored.

From the ecological viewpoint, threats to biodiversity are as follows:

- disappearance (direct and indirect extirpation or extinction) of biological species, their isolated populations distinguished by certain morphological, functional or ecological peculiarities, unique floral and faunal complexes, cenoses, and/or ecosystems;

- destruction (reconstruction, transformation) of certain types of landscapes as a result of agricultural activities (including hydrotechnical melioration), urbanization, and other processes;

- reduction of numbers and/or abundance of species and/or population to the critical level that results in complete or partial losses of their genetic diversity;

- introduction (spontaneous or artificial) of alien biological species that leads to the disappearance of aboriginal species or destruction of environment;

- use and release of organisms modified as the result of biotechnical measures (GMO, genetically modified organisms).

Threats to biodiversity can be identified from different viewpoints: based on the subject of threat, the mechanism of the impact, etc.

Numerous human-induced and environmental hazards can be subdivided into four categories: environmental (ecological), military, socioeconomic, and anthropogenous (anthropic) threats. This suggested categorization of hazards is conventional because while studying the problem of human, social, and environmental safety it is impossible to differentiate their impact in general. They and their impact have to be considered integrally, taking into account the interaction and hierarchy of relations. This principle should be the basis for solving the problems of human safety and environmental protection. Specific threats to biodiversity are caused by certain social and economic activities.

The once-dominant, evolutionarily balanced and autonomous course of

global biosphere processes has undergone considerable changes since human civilization started to rapidly exhaust natural resources to satisfy human needs. As the result of this, there is the essential pressure on all levels of organization of living matter, which used to be harmoniously integrated with the abiotic component of the planet.

Now the humankind is finding itself being at a “bifurcation point” when an ecologically justified strategy for preventing any further biodiversity losses should be considered in the context of humankind's survival. Under such circumstances, it is crucially important to preserve all components of biodiversity, in particular, natural ecosystems with multifunctional relations maintaining stable self-renewal in an unstable and changeable environment.

In Ukraine (in its modern borders) of the 1st century AD there resided about 1.5 million people whose activities considerably changed vegetation only in areas comprising a few percents of the territory. For the last period, 150-200 species (mostly endemic ones) of the flora and fauna have been lost; consequently, ecosystems underwent more significant losses than the gene pool.

During the Soviet period, as a result of the administration-controlled system of management, lack of democratic and socially oriented principles of management of natural resources, planning, allocation, and operation of industrial units, Ukraine underwent chemical and radiation contamination of her territory, overexploitation of natural resources, first of all, lands, mineral and water resources, which in many regions have reached the scope of ecological disaster. The total technogenic load upon the environment of Ukraine in the former Soviet Union exceeded 10-fold the average load in the USSR. Unwise territorial concentration of raw-material-intensive, multi-waste, as well as especially harmful industries at high density of population and insufficient financing of nature conservation activities have caused the complicated social and environmental situation in the country, and that situation has been further aggravated during the economic crisis. The consequences of this are contamination of air, water, lands, decline of soil fertility and soil degradation; all those developments finally caused the present state of the environment, which is threatening the very human existence, the flora and fauna, and leads to exhaustion of certain natural resources.

The actual perspective of losing many biological species, the very existence of which is supported by essentially transformed remnants of natural territories, is practically inevitable. There are many so-called "key mutualist" species from which depends coexistence of a significant number of ecologically dependent organisms. Because of that, extinction of some biological species in most cases triggers, according to the Domino principle,

the chain of extinction of other species.

1.2.2. Threats to biodiversity, connected with various aspects of human activity

1.2.2.1. Demographic aspect of threats to biodiversity

Urbanization and uncontrolled use of natural resources associated with it, most of all forests, rivers, and seashores, for recreational zones are direct threats to all components of biodiversity. Urbanized territories also effectively act as barriers for existing ecological corridors, thus breaking their integrity. In its turn, it alters historically formed migration pathways of living organisms, which is best manifested in regions where industrial and agro-industrial agglomerations are formed around large cities, on floodplains of rivers, around lakes, and at the seacoasts near such agglomerations. By this index, the Donetsk–Azov and Southern Crimean regions are on the first place, where over 80% of population is concentrated in cities, towns and town-type settlements, and in Donetsk Region, over 90%. It is also true for the regions with traditionally intensive agricultural activities. The share of the rural population is highest in the Carpathian and Cis-Carpathian, Transcarpathian Plain, and Roztochya-Podillya regions, where it exceeds the portion of the urban population; in several administrative regions of Ukraine (oblasts) it is over 60 people per square kilometer, and in several districts – 90 people per square kilometer. It is also necessary to take into account a temporary increase in the population density because of tourists, especially along the main tourist routes in the Carpathian and Cis-Carpathian, Transcarpathian, Mountain Crimean, South Coast Crimean, Volhynian – Malopolissian, and Roztochyia-Podillyia regions and along the coasts of the Black Sea and the Sea of Azov.

1.2.2.2. Industrial impact

Intensive development of industrial complexes and urbanization of territories are accompanied by devastation of natural landscapes and formation of the zone of technogenic landscape-geochemical systems, within the limits of which biochemical circulation patterns are essentially disrupted and new technobiogeocenoses are being formed, which are relatively stable long-lasting alliances of flora and fauna species, devastated landscapes, and physiographic conditions associated with them. On such territories, many parameters are changed, first and foremost their topography and relief, energy balance, distribution of precipitation, surface and subterranean flows, evaporation, and general patterns of circulation of energy, substances, and information. A specific hazardous feature of such landscapes is their simplified structure (as a result of a partial loss of biodiversity) that makes them closer to the initial chaos, increased entropy, impoverishment of the biota, and deterioration of human life conditions. Finally it results in

conservation of technogenic factors, and because of that self-renewal processes become impossible.

The greatest threat to biodiversity is heavy industry, its chemical, mining and extraction sectors, their wastes and discharges into the atmosphere. They are mostly concentrated in Donetsk–Azov, Right-Bank Steppe and Left-Bank Steppe regions. In those regions black metallurgy is concentrated, which uses more than 30% of fuel and almost 20% of electricity and water from the total amounts used by the country's economy. For example, the Kryvyi Rig ore fields provides about 90% of iron ore extracted in Ukraine. Coal extraction industry is concentrated in the Donetsk coal fields (so-called Donetsk Basin) having 92% of total coal resources of the country. Nonferrous metallurgy, sodium carbonate and nitric fertilizers production, by-product-coke industry, and heavy engineering industry are concentrated in these regions. There are also located major thermoelectric power stations with considerable discharges of harmful substances into the environment. They, together with metallurgic, coke-chemical, and chemical industries, discharge into the atmosphere more than 80% of all oxides, sulfur, nitrogen, and carbon causing acid rains, the greenhouse effect, and, together with automotive transport, are the main source of heavy metals, the concentration of which in vegetation and soils around industrial agglomerations exceeds maximum allowable concentrations 10 times.

1.2.2.3. Impact of the Chornobyl alienation zone

The unique situation is being formed for the biodiversity of the Chornobyl alienation (restriction) zone. According to scientific research in the zone, the flora and fauna under conditions of radioactive contamination are capable of systemic self-renewal and gradual population increase when there is no anthropogenic load. The zone of alienation gradually transforms into the largest in Europe area of wild flora and fauna where rare species of plants and animals are renewed and increase their populations, despite the counteraction of such specific threat factors as poaching, which, unfortunately, is widespread on the radioactively contaminated territories as well. Taking into account that radiation is an active mutagenic factor, we should expect some increase of biotic genetic diversity of contaminated territories and formation of new vectors of natural selection in ecosystems.

1.2.2.4. Impact of exploitation of mineral resources (quarries, mines, etc.)

Mineral resources as part of the Earth's interior, are the most important natural resources (by its weight, depth of extraction, and irreversibility of changes in the upper zone of the lithosphere). Today in the upper zone of our geological environment of some regions of Ukraine there were formed new geochemical (biochemical, atmochemical, hydrochemical)

conditions caused by bringing to the surface chemical elements and compounds that were stabilized in the lithosphere but which are now in an unstable state on the surface in the form of atmospheric pollutants, liquid discharges, and solid wastes. Because of that, their significant amounts are now included into the biochemical circulation chains through soils, water, and air. It essentially changes and decreases the stability of most biological complexes.

The most large-scaled activities are mining connected with coal and iron-ore extraction; in Ukraine during the 20th century their extraction amounted about 14 million tons. This results in a significant development of hazardous geological processes in the coal-extraction and iron-ore regions and districts of Ukraine. A similar situation (however, to a lesser degree) also occurs at oil and gas extraction sites, which can increase seismic activity. In general, as of 1 January 2003, in Ukraine there are 160.6 thousand ha of deteriorated lands in need of recultivation.

Closing down of mines with its further watersealing and local and regional raising of the aquifer (groundwater level), additional stratum faults and accelerated migration of contaminants can become a complex factor of critical destruction of the biodiversity structure, and it is of significant importance to implement urgent actions for biodiversity conservation in mining and mineral-extraction regions.

1.2.2.5. Impact of energy and transport sectors

A trend toward constructing new transport and traffic routes and corridors, especially highways, pipelines, etc., is evident. It reflects the general process of globalization of economics and Ukraine's determination to gain profits from operating the transport infrastructure.

The ecological, economic, social, and political efficiency of such solutions will be observed, first, in a certain period of time, and, second, only after the introduction of a new system of state statistics, new evaluation of economy efficiency, new progress criteria, etc.

Impact of traffic emissions is local and concentrated along the main motorways and in large cities and towns. The main threat, especially for animal migrations, is territory fragmentation. First, large-scale kills of animals occur on highways, especially on the sections that intersect with forest areas. Second, roads are barriers for animal migrations and feeding. Certainly, increased human activity that intensifies the barrier effect is connected with highways as well. An important adverse factor is the increased accessibility of ecosystems located along highways; it leads to animal disturbance, or poaching. To decrease the negative impact of highways it is necessary to build special crossings, and, while planning and constructing new roads, to choose the options with fewer intersections with

the ecological network, trying to leave the EcoNet core areas intact. By this parameter, the most threatened will be the ecological network in the Donetsk–Azov region, with its dense and heavily used network of international, national and local motorways, as well as the ecological network in the Dnipro part of the Right-Bank and Left-Bank Steppe zones.

With development of the network of power transmission lines, there has arisen the problem of birds' impacts with aerial wires. This problem is further aggravated because, on the one side, the growing number of short-circuit failures caused by birds increases the risk of de-energizing and blackouts of technologically important economic objects, and, on the other hand, death of birds, in particular endangered species, from the contact with power transmission lines hinders the solving of environment preservation and protection issues.

If proposed modern technological and other approaches in constructing power transmission lines are followed, then the number of birds dying of colliding with them will essentially decrease.

1.2.2.6. Impact of forestry and grassland cultivation from the viewpoint of threats to biodiversity

Forests and natural meadows are the long-lasting form of nature use; under the balanced management they provide a possibility of preserving many rare species of the flora and fauna. The effect of preservation is enhanced if the landscape is heterogeneous, and especially at spatial alternation and combination of forests, glades, meadows, lakes, mires, etc. Unfortunately, the existing technologies of forest and meadows exploitation lead to a simplified natural diversity. Total forest-felling (clear-cutting), destruction of undergrowth and herbaceous vegetation, and trends toward the artificial reforestation and afforestation leads to prevalence of monocultures, impoverishment of the forest species structure, and ecological changes in the environment. Similar processes also occur on natural meadows, which are transformed into mono- or bicomponent cultivated meadows, or are overgrazed, which results in the formation of ruderal or ruderalized plant communities.

1.2.2.7. Impact of water management

In recent years, a strong tendency of underflooding of significant areas it is observed, which results in catastrophic consequences for settlements and agricultural lands. It is mostly caused by unbalanced agro-industrial activities related to water and ecosystem management. Geological conditions, such as presence of loess strata laying on dense waterproof clay bedding, and a good vertical filtration capacity, influence the development of the process. It ensures favorable environment for the formation of technogenic perched groundwater (irrigated lands, settlements, water

reservoirs, etc.). Rapid raising of the aquifer level is also connected with weak natural drainage of the territory.

1.2.2.8. Impact of hunting

The role of hunting in biodiversity conservation and formation of threats to biodiversity is controversial and needs thorough consideration. Its significant role in biodiversity protection cannot be underestimated. However, hunting stipulates a specific use of animals as game.

As a result of inefficient hunting management and mismanagement of game animals populations that is accompanied by large-scale violation of hunting legislation and rules, in recent years there was observed a tendency to a significant decrease of populations of major game species of animals, even those listed in the Red Data Book of Ukraine – European bison, lynx, wildcat, capercaillie (wood grouse), etc. The population of moose (European elk), for example, decreased from 14,250 in 1990 to 4,490 individuals in 2001. This figure is lower than the numbers of many animal species included in the Red Data Book of Ukraine (e.g., badger and otter). The population of European bison – a priority species of rare mammals of Europe – decreased from 664 in 1992-1993 to just 432 in 2002.

1.2.2.9. Impact of fisheries

Fishery, as a national economy sector, the main task of which is protection, use, and renewal of aquatic living resources for obtaining various products, is a rather direct threat for biodiversity components: freshwater, saltwater, and anadromous fish species at all stages of their development, lampreys (Cyclostomata), waterfowl, marine mammals, aquatic invertebrates, crustaceans, worms, echinoderms, sponges, coelenterates, terrestrial invertebrates at the aquatic stage of their development, other aquatic animals, and non-vascular and vascular aquatic plants.

The problem that has not been considered before but is of significant importance now is the death of mammals and waterfowl in fishing nets.

1.2.2.10. Impact of agriculture upon the environment

The main factor of ecological destabilization of agro-landscapes is soil erosion. According to the on data of the State Committee on Agriculture of Ukraine, 19360.4 thousand ha of agricultural lands of the country can be subjected to deflation, 13284.2 thousand ha underwent water erosion (soil washout), 2056.2 thousand ha – undergo both water and wind erosion (data of 1 January 1996). Annually up to 11 million tons of humus are washed off with the products of soil erosion, the ecological balance of the environment is deteriorated, the species composition of ecosystems is impoverished, and

the ecosystem structure is simplified. The territories of the highest risk where eroded soils occupy up to 40-60% are as follows: Donetsk–Azov, Mountain Crimean and South Coast Crimean, most parts of the Left-Bank and Right-Bank Steppe, most part of the Carpathian and Cis-Carpathian, Right-Bank Forest-Steppe, and Roztochya–Podillya regions.

There are also significant zones of risk as a result of large-scale activities of drainage and amelioration of Polissia wetlands and irrigation of lands in the Right-Bank and Left-Bank steppe regions. For the aquatic organisms of the aquatic and wetland complex, the main threat is caused by drainage water contaminated by pesticides, toxic chemicals, mineral fertilizers, and household and industrial wastes. Waters containing heavy metals, organic substances, almost all imaginable toxic chemical compounds, and other pollutants are mostly discharged directly into the hydrological network, and it results in mass destruction of hydrobionts in water reservoirs and estuaries. On the other side, the creation of huge artificial reservoirs led to the decline of diversity of forests, meadows, floodplains, and their transformation into rather trivial communities of hydrobionts, as well as underflooding of significant areas.

Large-scale drainage works caused the degradation and over-irrigation of biogeocenoses, sharp decrease of the territories favorable as habitats of birds and mammals of the aquatic and wetland complex (beaver, muskrat, otter, waterfowl and other birds). Because of that, small remaining areas of biotopes of these species need special attention at livestock pasturing and hay-moving.

According to data of several authors, 40-100% of nests of game waterfowl are destroyed during livestock pasturing, depending on the loading. Early hay-moving also causes significant biodiversity losses in such habitats. In that case, not only nests are destroyed but also entire broods. In some species such losses from hay-moving reach 80-100% of the existing young offspring and up to 20% of adult birds raising their young (corn-crake, quail).

Careless application of pesticides and fertilizers also essentially affects wildlife preservation in reproduction sites of wild animals on agricultural lands. Based on data by various researchers, on the fields where pesticides and fertilizers were used, there perish 8-9% of young and 15-42% of adult hares, 5-95% of young and 15-52% of adult partridges. There are practically no negative consequences at fertilizer application directly before ploughing, and these adverse consequences are substantially decrease when pesticide-treated grain, which is used for extermination of harmful rodents, is not scattered over the ground but is applied directly into the holes or in various shelters.

Rather obvious and impressive is wildlife destruction during automated agricultural works. In Ukraine over 44% of young hares perish during the period of spring harrowing and cultivation. More losses are caused by moving and harvesting machines having no deferring devices (e.g. birdscarers), especially when such mechanisms are used without taking into account the main direction of escape of frightened or disturbed animals.

On the background of such data, it is necessary to pay special attention to the nature conservation means that are cost-efficient and do not require considerable financial expenses, do not decrease the agricultural production output, but significantly decrease the accidental death rate of wild animals.

Destruction of small areas of natural vegetation in the fields is yet another threat to wild plants and animals. It causes simplification of landscapes, destruction of refuges, impoverishment of ecosystems, and even disappearance of the species connected with a specific ecotone environment. Creation of technogenic geochemical landscapes (agrarian, contaminated by industrial urban agglomerations) in the biochemical aspect has led to fragmentation and levelling of diverse natural geochemical fields, which have resulted in disruption of biochemical flows and destruction of the basia of geochemical biodiversity.

In general, agrarian transformation of many landscapes have caused a large-scaled destruction of the biodiversity structure in the territory of Ukraine as a result of the regional impacts of the following factors:

- destruction and fragmentation of biogeocenoses;
- technogenic levelling of landscapes and simplification of the system of biogeochemical chains;
- contamination of surface waters and unprotected groundwaters;
- changes in the composition, structure and main characteristics of soils, their functional modes (water, heat, air), living conditions of soil biota, etc.

In recent years because of transition to market-oriented management, imperfection of national policy and legislation in the field of use and protection of natural resources, change of the system of land ownership, besides certain anthropic load mitigation and uncontrolled development of ecosystems (process of renaturalization), there occur various adverse phenomena that result in specific threats to biodiversity. They are as follows:

1. Lowered control over compliance with regulations of the national legislation in the field of use and protection of natural resources because of: (a) partial loss of regulatory functions of several regulations and lack of new ones; (b) insufficiency of an integral monitoring system; (c) inefficient

activities and their inadequate conformity to modern requirements of regulation of these problems; (d) insufficient funding, etc.

2. Violation of agricultural technologies by state farms and unjustified application of fertilizers and pesticides by private farmers.

3. Weed infestation of some agricultural lands that are not cultivated by new land-users, or not used for intensive farming.

4. Disintegration of collective farms (agroindustrial associations), sharing out of lands that increase the number of landowners, cause unpredictable of structural and functional changes of agricultural lands and further complicate the implementation of the State Program on Development of the National Ecological Network of Ukraine for the years 2000-2015.

5. Degradation of the system of protective and meliorative forest plantations, which were previously subordinated to the agroindustrial complex.

The basis of the strategy of prevention of negative consequences of natural resources use and one of the main means for preservation of natural resources renewal and environment restoration capacity of landscapes is management and control of the anthropic pressure upon the landscape. This control is performed either by limiting the impact within the ecological norms (enforcement of maximum permissible concentrations, maximum permissible emission, control over industrial wastes, allowable limits of use of natural resources, such as timber, game animals; norms for pasturing, logging, etc.) or by introducing the conditions of impact (regulation of hunting, fishing, gathering of non-timber resources, pasturing, logging, etc.) according to the concept of ecological regulation of loads.

While creating anthropogenic landscapes on the principles of sustainable development, social and economic considerations should be harmonized with ecological limitations. The principle of harmonization should be based on equality of economic, social, and ecological (environmental) values, with prevalence of the most significant ones. Monitoring of such relations should be introduced in legislation.

Under conditions of agricultural reforms in Ukraine, land privatization, and development of private farms, the system of decrease of specific threats to biodiversity composition should include, besides control over compliance with the norms of agrotechnology in the wide sense, promotion of alternative farming and production of ecologically clean products (that may be favorable in the conditions of rural population poverty). It is rather important to encourage traditional land use modes of without pesticides, to stimulate, financially and otherwise, the nature conservation style of private farming, i.e. to preserve sites of natural vegetation on agricultural lands, to plant border trees and other planting that play a significant role in landscapes

diversification and diversity enrichment in rural areas. That was done, for example, in the United Kingdom and several other European countries. In terms of institutional means of biodiversity conservation, it is advantageous to develop a system of mandatory and voluntary insurance against any possible damage caused by natural phenomena, including compensations for damage caused by endangered animals species.

While developing and constructing agricultural machinery and mechanisms, it is advisable to include into the technical norms the requirements for protecting wild animals, because recommendations for agricultural activities safe for wild animals and equipping the mechanisms by homemade frightening devices are impracticable and inefficient.

In general, there can be distinguished two groups of threats to biodiversity of agrolandscapes:

1) deterioration of environment; consequently, econiches are narrowed, biotopes are damaged and destroyed;
2) impoverishment of the trophic basis of environment, which causes a decrease in the biomass production capacity of ecosystems, transformation of biocenoses structure, trophic chains, etc.

The main factors that cause these adverse phenomena are as follows:

- erosion, dehumification, contamination, physical, chemical and other types of degradation of lands and soils;
- destruction of the optimal structure of agroecosystems (agrolandscapes), especially their high level of plowing up.

The causes of technogenic contamination of agrolandscapes are the use of chemicals in the agricultural production, atmospheric contamination by technogenic substances, irrigation with contaminated waters, and improper storage of obsolete supplies of chemicals (fertilizers, pesticides, etc.).

1.2.3. Threats to biodiversity on the landscape and ecosystem levels

Lately, because of the human impact, negative phenomena aggravated in most regions of Ukraine. For example, a weak natural runoff in the South of Ukraine was sharply intensified by construction of numerous dykes, ponds, and irrigation systems, which practically halted the solid runoff of terrigenous material from the continent. It resulted in the destruction of the sedimentary profile balance and deficit of terrigenous material in the shelf zone. The result of this is intensification of coastal abrasion (especially during storms) and destruction of sandy spits and shallows that is clearly observed at comparing space survey images made in different times. Taking into consideration that these sites are important as nesting areas for birds and spawning grounds for fish, it has an essential impact upon biodiversity of the coastal zone.

The disruption of hydrological and hydrogeological modes of territories (raising of groundwater levels, underflooding and swamping, changes of the natural drainage) together with other adverse consequences is a dynamic factor that can sharply intensify the impact of all anthropic factors upon the environment, and finally define the general ecological situation in the region.

In the Dnipro River basin, the hydrological environment is being disrupted as a result of large artificial water reservoirs, which have substantially altered natural biocenoses and habitats on that territory. In the mining and extraction regions of Ukraine the hydrogeological environment is changing relatively fast, which is further intensified by closing down of mining enterprises.

Data on monitoring of natural hazards and exogenous geological processes (floods, landslides, erosion, mudflows, abrasion, karst, subsurface erosion, etc.) shows that for the last 25-35 years their manifestation on the object-territorial level has increased by 3-5 times. If to take into account that most of those hazards and processes influence upon that state of landscape systems, then in zones of their technogenic activation biodiversity degrades in most cases.

1.2.4. Threats to biodiversity at the species and populational level

Among the anthropic factors, the most influential impact upon the endangered plants have the following: clear wood-felling (at least 91 species are affected), picking up flowers for bouquets (80), livestock pasturing (41) and pasture degradation (15), recreational load (37), harvesting of medicinal raw materials (28), digging up of plants (16), harvesting of wild edible plant resources (14), and others, which are main factors in all natural zones of Ukraine. Besides, there are factors caused by regional characteristics of the natural environment and management: road construction and development (Crimea), drainage of wetlands (Polissia, Forest-Steppe), plowing up of lands (Steppe, Forest-Steppe, the Ukrainian Carpathians, and Crimea). A significant deficiency of wild animal protection activities is the insufficient level of study of the state and lack of data on populations of most species. Nowadays, there are measures taken for breeding and surveys only of those animals that are the objects of hunting and fishing.

Among domestic animals, specific threats to biodiversity can be caused by non-native species that can naturalize in the natural habitats and occupy the ecological niches of aboriginal species, thus destroying the structural and functional relations in the ecosystem, or forming hybrids with wild animals, which may lead to similar consequences. For example, we can mention the dispersal and naturalization of American mink (*Mustela vision*)

kept at specialized fur animal farms. Escaping from these farms, it establishes local populations in natural habitats within the native range of European mink (*Mustela lutreola*, marsh-otter), where the last species still survived. It leads to the displacement of aboriginal species by the stronger competitor. Breeding of hybrids between wild boars with domestic pig (so-called *mangals*) at some farms may pose a threat to the genetic diversity of wild boar. This threat may become actual if such hybrids escape into natural habitats.

1.2.5. Evaluation of the capacity of reducing the threats to biodiversity and mitigating their consequences.

The compilation of cadastres of the flora and fauna is the first step in the process of biodiversity inventory. It is necessary that the next step in this direction is earmarked funding of scientific research of biodiversity indicators at the populational level and identification of populations that are better adapted and resistant to anthropic factors in order to provide their efficient protection. It is also necessary to develop methodological approaches to the ecosystem cadastre creation and to put them into practice.

For timely forecasting environmental risks and threats, data on ecological and ecosystem monitoring should be used. Such information is the basis for the analysis of tendencies and assessments of threats to biodiversity, as well as for quantitative evaluations of ecological losses for the environment. In this regard, it is useful to apply the approach based on the following evaluation criteria:

- sources of threats;
- threat impact;
- possibility of threat mitigation;
- complex criterion of threat evaluation where previous criteria are integrated applying appropriate weight coefficients.

Each criterion consists of several factors that are taken into account at evaluation and ranking of threats to biodiversity. The qualitative and quantitative composition of criteria and factors that may be used for evaluation and ranking of threats to biodiversity are shown on Fig. 1.1.

Composite criterion

Criterion of assessment of the threat source	Criterion of evaluation of the threat impact	Criterion of evaluation of the threat reduction possibility
Factor of evaluation of the threat type	Factor of evaluation of threat impact types	Factor of evaluation of a possible mechanism of threat elimination
Factor of evaluation of the threat origin character	Factor of evaluation of sectors affected by the threat	Factor of evaluation of the funding level necessary for threat elimination
Factor of evaluation of the threat origin source	Factor of evaluation of the scope of threat	Factor of evaluation of the time necessary for threat elimination
	Factor of evaluation of the threat impact level	Factor of evaluation of a possible degree of threat elimination
	Factor of evaluation of the threat impact significance	
	Factor of evaluation of the threat impact persistence	
	Factor of evaluation of the threat impact strength	

Fig. 1.1. Tree of criteria and factors of threats to biodiversity evaluation and ranking

By using calculations based on such methodological approach, there can be defined several groups forming four classes of threats by the generalized integral index. The results of professional evaluation in the ranking of threat intensity reduction are shown in Table 1.1.

Table 1.1. Classification and ranking of threats to biodiversity by the generalized integral threat index

CRITICAL THREAT LEVEL. Lasting threat impact will have irreversible consequences for biodiversity.
Complex impact of negative anthropic and natural factors
Fragmentation of ecosystems
Impact of technogenic changes of geological environment
Complex impact of large industrial centers (megalopolises)
Poverty and corruption
Raising recreational load, extension of recreational zones, country houses (holiday cottages)
Development of highway networks and transport routes
Intensification of farming
Intensification of forestry (forest planting, wood-felling, improvement felling, management felling, etc.)
Drainage amelioration
Destruction of floodplains
HIGH THREAT LEVEL. Threat impact with rather obvious results.
Military activities
Transboundary pollution transfer
Influence of quarries, mines, etc.

Pollution of water bodies with pesticides, herbicides, etc.
Eutrophication and hyper-eutrophication as a result of water contamination by biogenic elements
Commercial forest felling, selective forest felling
Construction of hydrotechnical units (dams, etc.)
Burning of vegetation
Straightening of stream channels and riverbeds of small rivers
Changes of land use technologies
Change of types and modes of land use
Poaching – new technologies (in particular, electric fishing rods, crossbows, etc.)
MEDIUM THREAT LEVEL. The expected impact is less significant.
Disruption of hydrological mode
Trade in animals and plants
Genetic contamination
Biological contamination, as a result of deliberate introduction or spontaneous immigration of non-native (alien, adventive) species
Electromagnetic fields
Acoustic pollution (noise)
Vibration
Raising of the groundwater (aquifer) level
Hydrochemical disruption of environment
Collecting activities, gathering of spring flowers, etc.
Frightening of animals (fishery, harvesting of medicinal plants, berries, firewood, etc.)
Radioactive contamination
Commercial fishery and fish farms
Natural disasters (storms, floods, erosion, abrasion, landslides, mudflows, etc.)
Livestock pasturing in forests
LOW THREAT LEVEL. Negative impact on ecosystems is insignificant.
Salinization
Hunting
Waterlogging from soil washout
Domestic animals
Development of electricity supply network
International terrorism
Medical needs

More complicated problem is the direct assessment of the impact upon biodiversity based on its indicators that needs more detailed scientific research and is far from being resolved so far.

1.3. Tendencies of biodiversity change

Beginning from the last century, nature of Ukraine has undergone critical changes under the anthropic influence. High population concentration in most industrial regions of Ukraine, placement of industrial complexes and military objects and their unification into the combined structure as a result of construction of numerous ways of connection,

pipelines, electricity transmission circuits, etc. have substantially changed landscapes and habitats of wild plants and animals.

Within the territory of Ukraine at present, there are about 1400 cities and towns, over 28 thousand of water reservoirs, about 20 thousand km of railroads, 10 thousand km of oil and gas pipelines, electricity networks, etc. High density of industrial urban agglomerations and spread of engineering networks over the territories cause a high (at least for Europe) level of technogenic fragmentation of the territory, with distortion of limits and structure of most landscape systems, most of all, geochemical fields, water and heat exchange fields, geophysical fields, etc.

In general, this technogenic deformation of territories is most evident within the mining industrial regions, large irrigation systems, and on the background of a large-scale reduction of forest areas.

The main sources of environmental contamination in Ukraine continue to remain industrial air pollutants (lately it is observed a tendency to their reduction), contamination of water environment, and placement of solid wastes as well as environmentally unbalanced use and storage of significant amounts of mineral and organic fertilizers, pesticides, etc.

Biogeochemical conditions in Ukraine are aggravated by oil and gas wells, which disrupt the isolation of the Earth layers that leads to the vertical migration of hydrocarbons through closed and abandoned wells, prospecting shafts, and wells at outdated oil extraction enterprises.

Starting from 1985, at the enterprises of Ukraine there have been formed 101-136 million tons of toxic wastes. The total amount of their accumulation has reached 5 billions tons. There are 300 waste storage facilities (landfills, etc.), in which the content of toxic substances exceeds the maximum allowable concentrations 50 and more times. Some waste-accumulating facilities without appropriate engineering protection have become the sources of regional contamination.

Environmental pollution leads to the inclusion of contaminating substances in biochemical chains of flora and fauna and to their chronic intoxication.

As a result of large-scale drainage works, wetlands of Polissia, which are under the threat of disappearance, have undergone substantial losses. From the other hand, there has been conducted irrigation of the Southern Steppe and formed a cascade of the Dnipro River water reservoirs that at present results in underflooding of hundred thousand hectares of the Black Sea lowland. Moreover, contamination from agriculture and industry, not taking into account the Chornobyl catastrophe, has spread over large territories. All this has caused profound changes of biodiversity at the genetic, species, and ecosystem levels. Despite some decrease of the

anthropic pressure upon the environment as a result of the negative development of macroeconomic processes in several regions of the country, biological resources are only moderately renewed and will hardly return to their initial state.

The general analysis of threats to biodiversity shows that the main among them is clear wood-felling, recreational load, livestock pasturing and pasture degradation, harvesting of bioresources for medicinal and food purposes, etc. Lately, massive construction and development in floodplains of large and medium-size rivers and other ways of destruction of floodplains have become of great significance.

These factors adversely impact 140 species of animals, or 74.9% of species listed in the Red Data Book of Ukraine. Among other anthropic factors that should be taken into account it is necessary to indicate the following ones: disruption of the natural structure and stand density of forests (11), management felling of forests (11), grubbing of rarefied forest stands (6), construction of hydroelectric power plants and inundation of floodplains (5), and development of forest plantations (4). The threat to ecosystems caused by invasions of alien species of plants and animals is growing, and has already reached a nearly catastrophic level. The threat from using genetically modified organisms is also potentially high.

In any case, there is no doubt that there is a threatening tendency to further degradation of the natural environment.

CHAPTER 2. CONSERVATION AND USE OF BIODIVERSITY, ACCESS TO NATURAL RESOURCES, TRANSFER OF TECHNOLOGIES, AND BENEFIT-SHARING.

2.1. Biodiversity conservation: an outline of the present state

2.1.1. Conservation status and needs of protection of species of plants and animals, and plant communities

According to the Law of Ukraine “On the Red Data Book of Ukraine”, the Red Data Book is the main national document which contains generalized data on the modern state of rare, threatened and endangered animal and plant species of the fauna and flora of Ukraine, and lists actions necessary for their preservation and renewal. The Red Data Book is the basis for developing further actions aimed at protection of animal and plant species listed therein. The first edition of the Red Data Book of Ukraine was published in 1980 and included 151 species of vascular plants and 85 species and subspecies of animals. The second edition of the Red Data Book of Ukraine (1994, 1996, now in force) includes 541 species of plants and fungi and 382 species of animals. Such an impressive increase of the number of endangered species is mostly caused by the increasing anthropic pressure upon natural ecosystems.

Representation of the flora of Ukraine in the Red Data Book of Ukraine (RDBU) is summarized in Table 2.1.

Table 2.1. Species diversity of the flora of Ukraine and its representation in the first and second editions of the Red Data Book of Ukraine.

Taxonomic group	*Number of species in the flora of Ukraine*	*Red Data Book of Ukraine (1980)*		*Red Data Book of Ukraine (1996)*	
		Number of species	*%*	*Number of species*	*%*
Vascular plants (native and alien species)	*5310*	*151*	*2.8*	*439*	*8.3*
Bryophytes (mosses and hepatics)	*763*	*–*	*–*	*28*	*3.7*
Algae	*4908*	*–*	*–*	*17*	*0.4*
Lichen-forming fungi (lichens)	*1322*	*–*	*–*	*27*	*2.1*
Fungi	*5227*	*–*	*–*	*30*	*0.6*

These data shows that most species listed in the Red Data Book of Ukraine are vascular plants; however, at the present stage of research and inventory of rare and threatened species of non-vascular plants and fungi, it is well known that these components of the biota also suffer from the dangerous environmental changes and have to be protected along with vascular plants. However, in the legislation of Ukraine, as well as other countries of the world, there are few properly prepared and put into force materials on conservation and protection of non-vascular plants and fungi. In Ukraine these organisms are mentioned only in the Red Data Book of Ukraine (1996) and in a few provisions of several legislative acts.

Moreover, according to the viewpoint of scientists, the species diversity of cryptogamic plants and fungi in the biota of Ukraine could reach about 23 thousand species constituting over 82% of the total floral diversity. Although, there are no red lists of algae, bryophytes, and fungi of Ukraine, and the recommendations of the International Union for Conservation of Nature and Natural Resources (IUCN) are not adapted for conservation of algae and fungi. There are no Ukrainian species listed among 36 species of non-vascular plants that are subjected to special protection according to Appendix 1 of the Bern Convention (1979).

The analysis of various lists of rare species of the flora and fauna proposed for inclusion into the Red Data Book of Ukraine and regional red lists clearly demonstrated that they have been compiled on different principles. At present there is a tendency to the excessive expansion of such

lists, and it will be impossible to provide effective protection for some species, especially microorganisms. There are also cases when alien species have been included in or proposed for red lists; such species usually occur in Ukraine rarely but could potentially expand their ranges and even become dangerous for the aboriginal flora.

Species diversity of the fauna of Ukraine and its representation in the Red Data Book of Ukraine (table 2.2).

Table 2.2. Species weald of fauna of Ukraine and its representation in the Red Data Book of Ukraine (RDBU)

Phyla of animals	Species	RDBU-94		Classes of chordates	Species	RDBU-94	
		n	%	(vernacular names in parentheses)			%
Protozoa sensu lato (protozoans)	1224	0	0.0	*Total non-chordate animals*	*33606*	*227*	*0.7*
Porifera (sponges)	39	0	0.0	*Chordozoa* (*chordates*)	*703*	*151*	*21.5*
Coelenterata (coelenterates)	34	2	5.4	In particular by classes:			
Ctenophora (ctenophores, comb-jellies)	1	0	0.0	Appendiculariae (appendicularians)	1	0	0.0
Plathelminthes (flatworms)	780	0	0.0	Ascidiacea (ascidians)	8	0	0.0
Nemertini	33	0	0.0	Cephalochordata (lancelet, or amphioxus)	1	0	0.0
Nemathelminthes (nemathelminths)	1667	2	0.1	Cyclostomata (cyclostomes, lampreys)	2	2	100.0
Acanthocephala	57	0	0.0	Chondrichthyes (cartilaginous fishes)	3	0	0.0
Annelida (annelids, or segmented worms)	210	7	3.3	Actinopterygia (actinopterygian bony fishes)	176	28	15.1
Sipunculida	2	0	0.0	Caudata (caudate amphibians)	6	3	50.0
Mollusca (mollusks)	617	12	1.9	Salientia (anuran amphibians)	13	2	15.4
Tentaculata	26	0	0.0	Testudinata	1	0	0.0

				(turtles)			
Arthropoda (arthropods)	28902	204	0.7	Lepidosauria (lepidosaurian reptiles)	20	8	40.0
Echinodermata (echinoderms)	12	0	0.0	Aves (birds)	340	67	19.7
Chaetognatha (arrowworms)	2	0	0.0	Mammalia (mammals)	132	41	31.1

The absolute number and share of rare species have the highest values in phylogenetically youngest and taxonomically most diverse groups of chordates—birds and mammals. The most vulnerable groups of animals are those located in the crown parts of phylogenetic trees; they are characterized by large sizes and occupy the highest levels of trophic pyramids. The losses of the total species diversity are highest in these groups.

The rates of expansion of red lists will remain high, and during the coming phase of their review it is expected that these lists will be expanded by 2/3 of the present regional fauna of vertebrates as the highest specialized group of animals (in particular, the superclass of amniotes).

Green Data Book of Ukraine. The highest priorities in biodiversity conservation at the level of cenoses (communities) are defined by the Green Data Book of Ukraine, which includes 127 plant communities (forests – 51, shrubby vegetation – 5, subshrubby and steppe vegetation – 26, meadows – 16, aquatic communities – 16, other communities –12; see Table 2.3.).

Table 2.3. Synecological diversity of Ukraine and its reflection in the Green Data Book of Ukraine

Plant communities	Number of communities according to:	
	Prodromus of vegetation of Ukraine, 1991	Green Data Book, 1997 (official data)
Associations	3 806	127
Formations	348	
Including:		
Forests	28	51
Shrubby communities	27	5
Subshrubby and steppe communities	71	26
Meadows	54	16
Mires	53	—
Aquatic communities	56	16
Others	—	12

Biodiversity of Ukraine is its national heritage, and its preservation and sustainable use is considered among the priorities in the sector of natural resources use, ecological safety and nature conservation, and an inalienable condition of sustainable economic and social development of the country. Biodiversity preservation can be performed *in-situ* and *ex-situ*. According to Article 2 of the Convention on Biological Diversity, the term '*in-situ* conservation' means the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surround-ings where they have developed their distinctive properties; the term '*ex-situ* conservation' means the conservation of components of biological diversity outside their natural habitats.

2.1.2. *In-situ* protection

The most efficient mode of *in-situ* protection of biodiversity still remains the protection of natural complexes and, in particular, the biota of territorial systems requiring special protection. In Ukraine, there are laws regulating protection of nature in the system of protected areas of the Nature Conservation Fund.

According to the data provided by the State Board of Natural Reserves under the Ministry of Environment and Natural Resources of Ukraine as for 01 January 2003, the nature conservation network consisted of 7,040 individual areas and objects with the total area of 2,715,400 ha, or 4.5% of the total area of the country. Comparing to 1992, the share of the areas included in the Nature Conservation Fund (NCF) nearly doubled. NCF of Ukraine includes 4 biosphere reserves and 17 nature reserves, 12 national nature parks, 2,595 game reserves, 3,000 nature monuments, 37 arboreta (dendrological parks, dendroparks), 536 parks – monuments of gardening and park development art, 22 botanical gardens, 12 zoological gardens, 43 regional landscape parks, and 762 protected sites (See Table 2.4)

Table 2.4 Increase in the number and area of the Ukrainian NCF objects during the last 10 years

Category	Number of objects		Area of objects, thousand ha	
	1992	2002	1992	2002
Objects of NCF				
Biosphere reserves	–	4	–	222.5
Nature reserves	12	17	207.5	163.7
National nature parks	3	12	123.2	632.1
Game reserves, incl.: – of national importance – of regional/local importance	1711 227 1474	2595 292 2303	746.7 330.0 416.7	1067.4 356.4 711.0
Monuments of nature, incl.: – of national importance – of regional/local importance	2661 123 2538	3000 132 2868	16.3 4.9 11.4	24.4 5.7 18.7

Regional landscape parks	1	43	42.1	603.6
Protected sites	672	762	68.5	82.0
Total	5063	6433	1204.3	2697.9*
Man-made objects				
Botanical gardens, incl.: – national – regional/local	16 16 –	22 17 5	1.9 1.9 –	2.0 1.9 0.1
Zoological gardens, incl.: – national – regional/local	6 6 –	12 7 5	0.1 0.1 –	0.4 0.1 0.3
Arboreta (dendroparks), incl.: – national – local	19 19 –	37 19 18	1.2 1.2 –	1.5 1.35 0.13
Parks –monuments of gardening and park development art, incl.: – national – regional/local	479 83 414	536 88 448	13.1 5.8 7.3	13.6 6.0 7.6
Total	520	607	16.3	17.5

Note: * – actual area of natural objects of the NCF of Ukraine (excluding areas of the objects of NCF included into the territories of national nature parks and regional landscape parks).

Program of Perspective Development of Nature Conservation Activities in Ukraine (1994), National Program of Dnipro River Basin Environmental Rehabilitation and Improvement of Drinking Water Quality (1997), State Program of Development of the National Ecological Network of Ukraine for the period of 2000 – 2015 (2000), State Program of Rehabilitation of the Marine Environment of the Black Sea and the Sea of Azov (2001) envisage that a considerable number of new national nature parks, biosphere and nature reserves, regional landscape parks, as well as expansion of the existing objects of the NCF will be carried out in the future. In general, by 2015, the area of NCF objects will be increased from the current 4.2% to 10.4 % of the total area of Ukraine, approaching the figure for EU.

Basic principles of establishment of a network of nature conservation areas include:

— *principle of regional representation* according to which the whole diversity of biotic and landscape components of Ukrainian nature should be represented in NCF objects;

— *systemic approach* to assessment of biosphere values of a natural territory, under which NCF objects are considered as integrated components (natural and territorial complexes), individual components of which (rocks, waters, soils, biota) are interconnected at the energy-mass level.

— *principle of uniqueness and typicality (representability)* of natural territories, which implies the need to conserve both unique and typical ecosystems and landscapes.

Principal criteria for identification of a territory and nature object as belonging to NCF include the following ones:

— *degree of landscape preservation* as a habitat for animals, plants, and fungi;

— *threat of losing* a certain type of landscape;

— *degree of uniqueness and rarity* combined with the level of *representation*;

— *presence of a range of natural and territorial complexes, characterized by certain hydrological, thermal, edaphic, and geochemical factors of the abiotic environment;*

— *degree of anthropogenic transformation of landscapes and possibility of their recreational and economic use*.

At present, inventories of biodiversity, though mostly incomplete, have been carried out only for natural reserves and national nature parks (NNP) . In respect to other objects of NCF, inventories of the biodiversity level are still very fragmentary.

Therefore, according to the results of the preliminary analysis, at present 414 species of vascular plants included in the official lists of rare and threatened species are registered in natural reserves and national nature parks. It makes up about 8% of the whole flora of vascular plants of Ukraine. About 110 plant species of Ukraine are included in the European Red List, more than 70 species are included in the IUCN Red List, 327 plant species are listed in the Red Data Book of Ukraine, 27 species, in the Bern Convention list; 63 species, in the CITES list. Based on these criteria, the most valuable protected areas in Ukraine are the Yalta Mountain and Forest Reserve, which houses 96 rare species of plants; Carpathian National Nature Park (89 species); Carpathian Biosphere Reserve (79 species); Karadag Nature Park (78 species); Ukrainian Steppe Nature Reserve (69 species), which confirms the hypothesis of uniqueness of the Crimean and Carpathian centers of rare flora. The lowest numbers of rare plant species are registered in such nature reserves as Dniprovsko-Oril'sky Nature Reserve (10 species); Rivne Nature Reserve (13); Polissia Nature Reserve (14), and Yelanetsky Steppe Nature Reserve (14 rare species).

Nature reserves and national nature parks of Ukraine currently have at least 20 rare species of bryophytes. Seven of them are listed in the Red List of European mosses, and 16 species are included into the Red Data Book of Ukraine. They are reported only in nine nature reserves. The largest population of species of bryophytes grows in Carpathian National Nature Park (9 species) and in Crimean Nature Reserve (3 species).

Nine species of algae listed in the Red Data Book of Ukraine are registered in 6 nature reserves and national nature parks of Ukraine, with their largest number found in Karadag (4 species) and Mys Martyan (Cape Martyan) (3 species) nature reserves.

Rare taxa of the mycobiota are represented in nature reserves and national nature parks of Ukraine by 22 species of fungi and 26 species of lichens (lichen-forming fungi) listed in the Red Data Book of Ukraine. Four species of fungi, which are currently reported only from 10 nature reserves, are recommended for inclusion into the Bern Convention list. The largest numbers of taxa are found in Yalta Mountain and Forest Reserve and Crimean Nature Reserve (10 species in each). In Carpathian Biosphere Reserve and in Roztochya and Kaniv nature reserves, there are 6 rare species in each. However, there is no data on the presence of such rare species of fungi in national parks of the country. Rare species of lichen-forming fungi (lichens) listed in the Red Data Book

of Ukraine are represented in 12 nature reserves and national nature parks. Their highest numbers are found in Carpathian Biosphere Reserve (12 species), Carpathian (11) and Uzhansky (9) national nature parks.

Rare plant communities included in the Green Data Book of Ukraine are represented by 456 associations; they are fully represented at the territories of nature reserves and national nature parks of Ukraine. Of this number, 41 phytocenoses are included into the Bern Convention lists, 8 communities are restored in botanical gardens of Kyiv (National Botanical Garden), Donetsk (Donetsk Botanical Garden) and Yalta (Nikitsky Botanical Garden – National Scientific Center). Most of these rare phytotcenoses require absolute and controlled regimes of their conservation and protection.

At the present stage of nature conservation, the issue of securing protection of some plant communities, which have become rare due to the large-scale transformation of natural landscapes, becomes especially urgent. They include steppes, meadows and alpine petrophytic plant communities.

Unfortunately, during recent years, the process of establishment of new nature protection objects nearly halted. For further development of the system of NCF, it is needed to take into account new economic conditions of transition to market economy in Ukraine and also to consider the needs for harmonization of the Ukrainian legislation with that of EU, and commitments in regard to international conventions.

Nature conservation activities as a basis for nature protection are not well developed yet and face a number of unresolved problems, including the following: alienation of lands for their further conservation and protection and persuasion of authorities, land users and population at large that such land alienation is necessary; impossibility to establish a representative network of protected areas due to the considerable level of anthropic transformation of landscapes, lack of officially recognized methodology of land alienation for this purpose and designing of nature conservation territories in Ukraine. Also, the level of funding of research in the field of establishment of a representative geographical network of nature conservation areas in Ukraine is quite insufficient.

It is necessary to point out that in Ukraine all existing nature conservation programs are directed at present at establishment of rather large nature conservation units of the highest level of protection, such as nature reserves, national and regional nature parks, game reserves, which are in the state ownership. Initiatives to organize protection of some territories are mainly put forward by individuals or organizations, which are far away from involvement into material problems faced by local population which is doomed only to face and comply with newly imposed bans and prohibitions relating to carrying out various economic activities. This situation and lack of efforts to influence and develop positive attitudes of the local population are roots of potential conflicts between the need and desire to obtain certain material benefits from using natural resources and the need to protect this natural wealth in the virgin state.

In connection with land privatization processes currently developing in Ukraine, many small plots of land, which are often cores of wildlife habitats, become private and

are subject to the threat of destruction due to land plowing, construction activities, and animal grazing. The need to identify so-called "micro-reserves" (a new category of nature conservation objects), which are located at small areas with highly valuable natural features – becomes even more urgent. Initiatives to establish such "micro-reserves" should come from landowners, who understand the need to secure careful attitudes to local nature and resources.

They also can be established by an initiative of some individuals or organizations, both private and public ones, and can be in private or public property. Their owners should be responsible for managing such "micro-reserves". The areas of such micro-reserves can be within the range of 0.01 – 1 ha. Not only plots of land with natural vegetation, but also artificially renewed or re-introduced populations of rare plant species or plant communities can be declared micro-reserves. The objective of establishing micro-reserves is to conserve valuable plant communities and individual species of wild plants (endemic, relict, Red Data Book plant species). They also may include plant species included into the European Red List, the Bern Convention list, as well as into regional lists of rare species. Another objective could be to protect type collection sites (*locus classicus*) of plant species scientifically described from Ukraine and to protect habitats, feeding grounds and places of recreation for wildlife species. Micro-reserves are especially important for protection of small-sized living organisms. Among plants, they include mosses, lichens, algae, and among animals – invertebrates (mainly insects), amphibians, reptiles, and small mammals. The territory of such micro-reserves should have ecologically safe regimes of conservation and use of living organisms, contributing to the protection and reproduction of their bioresources.

In addition to the units of the NCF system, there are other natural areas (so- called "special designation territories" – SDT), at which some special measures for conservation of biodiversity are undertaken. According to the Land Code of Ukraine (2001), they include protected lands (except of lands of the Nature Conservation Fund), such as lands under wetlands, which are not included into lands of the forest and water funds, and land areas, within which there are natural objects of a considerable scientific value (Article 46), as well as lands used for health protection purposes (Article 47-49), recreation (Article 50-52), lands of cultural and historical importance (Article 55-64) as well as, partially, lands of the forest and water funds (Article 55-64). According to the Forest Code of Ukraine (1994), all forests of the 1st group (64.5% of total) perform nature conservation functions (e.g. sanitary-hygienic, and water protection). Forest of special-purpose use and, especially, protective forest plots belonging to forests of the 2nd group (8.7% of the total forest area) also are used for such functions. According to the Water Code of Ukraine (1995), lands of the water fund, especially those located at riparian protection zones and alienation zones, are also subject to some limitation in their usage aimed at support of ecological functions of these lands and their biodiversity. The coastal shelf zone of the sea is also considered as an area, where special marine biodiversity protection activities should implemented. Issues relating to the use of bioresources of the coastal zone of the seas are regulated by the Law of Ukraine "On Exclusive (Marine) Economic Zone of Ukraine" (1995). Of special importance are lands belonging to the Ministry of Defense, especially lands used as firing ranges, test sites, and training areas. Their especially high level of protection, including their protection against any unauthorized use of resources, makes these lands and territories crucially important for biodiversity conservation.

Real development of the national ecological network currently started in Ukraine. This network should unite all territories with valuable natural biodiversity and serve as unified ecological framework of the country. In the field of conservation of biological and landscape diversity, the idea of ecological network is one of the most fundamental ideas emerging in the recent decades. The Pan-European Ecological Network is a principal initial element of the Pan-European Biodiversity Conservation Strategy. According to the Concept of Biodiversity Conservation in Ukraine (1997), establishment of the national ecological network is considered among the principal activities under this Concept.

At present, Ukraine is an active participant of the process of establishment of the Pan-European Ecological Network. The legal basis for establishment of the ecological network is the Law of Ukraine "On Protection of the Natural Environment", "On the Nature Conservation Fund", "On the Animal Kingdom", "On the Plant Kingdom", "On the Red Data Book of Ukraine", "On the State Program of Development of the National Ecological Network of Ukraine for the years 2000 – 2015", as well as relevant laws of Ukraine on the Land Code, Forest Code, and Water Code. The Verkhovna Rada (Parliament) of Ukraine is about to consider the draft law "On the Ecological Network"; it will serve as a basis for the use, protection, and rehabilitation of natural landscapes and biodiversity in Ukraine. This draft tries to combine in a comprehensive way the international and local legal experience, requirements of international conventions, the Pan-European Biological and Landscape Diversity Strategy, Concept of Conservation of Biodiversity in Ukraine, as well as many other documents.

In addition to that, several international projects related to the ecological network are being implemented in Ukraine. They include projects funded by UNDP and IUCN. Yet another project supported by IUCN was initiated in 2002; its goal is to establish a functioning ecological network section in the Ternopil region of Ukraine. Cartographic models of regional and zonal ecological networks, e.g. for Mykolayiv and Poltava regions, were also developed.

Among the overall diversity of nature conservation areas of Ukraine, which will be included into specific components of the ecological network of the country, of especial importance are those located in transboundary areas and are parts of large natural cores of international importance, or belong to international ecological corridors and serve as links between the ecological network of Ukraine and ecological networks of neighboring countries, such as Moldova, Romania, Hungary, the Slovak Republic, Poland, Belarus, and Russia.

Efficiency of establishment and management of the territories and units of the national ecological network depends on implementation of several of principal measures:

— inventory and passportization of the territories important for conservation of biodiversity and designating them as territories subject to protection;

— organization of the territory management aimed at support of biodiversity, especially vulnerable species, with the help of local population;

— organization and implementation of public outreach and environmental education campaigns for raising the awareness level and formation of conscious positive attitudes of local population to the idea of the ecological network;

Therefore, it may be stated that Ukraine has all required preconditions, including the legal and regulatory basis, environment protection infrastructure, territorial potential (lands of NCF, other lands with some level of protection or protection status), scientific and information potential for implementing the idea of biodiversity conservation by using concept of ecological networks.

2.1.3. Conservation *ex-situ*

Despite the fact that species conservation *in-situ* is considered the best currently available strategy, implementation of this strategy is not always possible. In such cases, *ex-situ* conservation strategies are used.

Ex-situ approach includes protection of seeds, pollen, tissues, genetic material in living collections (e.g. living collections of species, plantations, arboreta, and botanical gardens), clone banks, or other established forms and modes of *ex-situ* conservation.

In Ukraine the principal media for *ex-situ* conservation and reproduction of endangered components of biodiversity are botanical and zoological gardens. Establishment of seed banks as a mode of biodiversity conservation is also considered as an important one.

2.1.3.1. Conservation of biodiversity in botanical gardens

Of 677 European botanical gardens and arboretums, 56 are located in Ukraine. Of this number about 25 are botanical gardens in the strict sense, 16 dendroparks, 15 arboreta of forest science and forestry faculties at educational institutes or forest research stations. According to their administrative subordination, botanical gardens are divided between the National Academy of Sciences (3), Ukrainian Agricultural Academy of Sciences (1), botanical gardens of universities and various institutes (18), and others (3). Their distribution in the country is nonuniform, which is also true in respect of their distribution by botanical and geographic zones: Polissia – 1, Forest-Steppe zone – 13, Steppe zone – 7, the Carpathians and Crimea – 2. Of 24 administrative regions of Ukraine, the following ones have no botanical gardens: Chernigiv, Rivne, Ivano-Frankivsk, Kirovograd, Mykolayiv, and Lugansk regions.

Botanical gardens are active implementers of activities outlined in Articles 7 and 8, and especially Article 9 of the Convention on Biological Diversity, and thus they serve as important links in the general state system of nature conservation activities. Botanical gardens play an important role in implementing Article 9 of the Convention, which concerns *ex-situ* conservation of biodiversity both in Ukraine and other countries of the world. They secure conservation of germplasm through maintaining live collections, seeds banks, field genetic banks, tissue cultures, develop and carry out programs for rehabilitation of populations of species in natural habitats by carrying out their preliminary *ex-situ* research and reproduction.

Botanical gardens in Ukraine are leading institutions for implementing the provisions of Article 10 of the Convention. Their daily scientific research is a factor contributing to preventing and minimizing numerous adverse impacts upon biodiversity,

because they are prospecting for economically valuable species, study them for their further introduction and undertake primary reproduction, transfer plant materials for its large-scale production and utilization by different sectors of economy, especially in horticulture, medicine, forestry, parks and forest plantation.

Botanical gardens play an important role in implementation of Article 12 of the Convention. All botanical gardens carry out scientific research in various fields of biology and related sciences. In addition to their contribution into introduction and acclimation of plant species, botanical gardens participate in studies of the flora, solve of various environmental problems, deal with issues of taxonomy, ethnobotany, anatomy and morphology of plants, horticulture and agriculture. There are a number of educational programs, namely for practical works and studies by students, based on activities of botanical gardens. Some training courses for horticulturists and other applied experts are organized, and consultative assistance is also provided.

In Ukraine, practical work in the field of *ex-situ* conservation of endangered species of plants became more active and purposeful by the end of the 1990s, when, by an initiative of the M.M. Gryshko National Botanical Garden of the National Academy of Sciences of Ukraine, at one of the meetings of the Council of Botanical Gardens, a decision was made on voluntary commitment of participating botanical gardens to establish and maintain a specified number of plant species listed in the Red Data Book of Ukraine, at their territory, in *ex-situ* collection, and, when necessary, to reproduce them and introduce them into natural environment.

As a result of these organizational measures aimed at conservation of endangered species, 20 botanical gardens showed their commitment to conserve 400 plant species under *in-situ* conditions. However, they do not represent all Red Data Book plant species of Ukraine. Moreover, according to information from the Council of Botanical Gardens, in addition to 39 plant species not represented in the *ex-situ* collections, dozens of them are not duplicated (i.e., they are maintained just in one of the botanical gardens of Ukraine). This shows that this work, for its successful completion, should be much improved.

In addition, due to financial difficulties, implementation of these works is carried out less than by half of the existing botanical gardens. For successful efforts, participation of all remaining organizations is crucial and, therefore, some possibilities should be found for their involvement into this work, which is important for Ukraine and the whole humankind.

It is also important for Ukraine to solve the problem of establishment of a modern centralized national depository for long-term storage of germplasm. As to works on development of such a depository, the role of botanical gardens may be only in constant and concentrated lobbying of this idea at all possible levels. But tasks of development of support systems for such depository in the form of duplicating banks for short-term and medium-term storage of genetic resources (e.g. seeds, vegetative organs, pollen, tissue cultures etc.) of endangered species of the flora and genetic plant resources belonging to different groups of economic, cultural or other categories of value of other components of the plant world of Ukraine should be obligatory included into workplans of, at least, majority of such organizations (e.g. botanical gardens).

Botanical gardens of Ukraine have all necessary resources for their active involvement in implementation of the CITES Convention. Concerning plants trade, the reality and the available potential require that botanical gardens should become central links in the infrastructure securing activities under CITES, including wide public awareness and educational activities.

Botanical gardens of Ukraine, especially the oldest historical arboreta (dendroparks) established on the basis of old parks-monuments of garden and park art, are centers of not only important natural, but also cultural heritage. Therefore, there are objective grounds for their involvement in implementation by Ukraine of the international Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention). At present, only the Sofievka Dendropark is included in the world heritage list. However, there are also other objects, which may be included into the world cultural and natural heritage list. In the near future, the principal task within the framework of this Convention will be to identify and prevent grave threats currently existing in Ukraine in respect of many valuable monuments of culture and nature, which in a long-term perspective may become a part of the world heritage.

Among the urgent problems to be solved by botanical gardens in Ukraine is establishment of cooperation with similar organizations abroad, including such international organizations as the International Council of Botanical Gardens on Protection of Plants; only exchange of letters and current information is maintained with the Secretariat of this Council at present. However, not only on international level, but also at the national level, botanical gardens face the problem and task to arrange cooperation and interaction between various institutions in order to improve the efficiency of their joint work.

Lack of a unified information base is a rather serious problem for botanical gardens of Ukraine. Therefore, currently nobody in the country has complete knowledge about the size of collections and their actual conditions. The catalogues, which are sometimes published, frequently contain outdated information. It is related to the fact that live collections are quite changeable, dynamics of changes of which, even under conditions of increase of their total number, necessarily include losses of some individual components under impacts of various natural and anthropic factors. Electronic databases would permit to rapidly obtain information about such changes, see their actual state at a certain period both for individual organizations and at the national level.

2.1.3.2. Protection of biodiversity in zoos

Protection of animals *in-situ* is an important stage in implementation of programs of protection of rare animal species in nature (*in-situ),* since more and more often state of a population *ex-situ* becomes crucial for survival of a species. At present, there are regional programs for conservation of more than 300 endangered animal species in the world. According to assessments of the World Nature Conservation Strategy of zoos, zoos can maintain healthy populations of 1,000 – 2,000 rare and threatened species of animals. Active participation of zoos in programs for re-introduction and rehabilitation of

populations of rare animal species applied in respect to 120 species shows their significant conservational potential.

Populations of rare animals in zoos may directly support their survival *in-situ* by providing material for renovation or strengthening of natural populations. Tools used for analyses of conditions of a population include herd books, PC software for population management, and computerized databases for registration and inventory of animals (e.g. ARKS, which is used by more than 400 zoos of the world, or ISIS, an international system for animal species information).

Zoos of Ukraine can successfully protect rare species of animals only if they clearly coordinate their activities and are involved in the work of the European animal breeding programs (e.g. EEP) and various international associations. More than 1,000 zoos of the world are united into zoological associations, which exist in many countries of the world at the national level and, for some continents, at the regional levels.

At present, 22 agencies for maintenance and reproduction under special conditions of certain groups of wild animals function in Ukraine. They include 16 zoos, 2 zooexotariums, 1 marine aquarium-museum, 3 specialized enterprises such as: JSC "Bion Terrarium Center" in Kyiv, SPA "Lacerta" in Kharkiv, and the ecoagrocompany "Fauna" in Kharkiv Region (See Table 2.5). 12 zoos of Ukraine are objects of NCF; 7 of them are of the national importance status (Kyiv, Mykolayiv, Kharkiv, Odessa, Cherkasy, Rivne and Mena zoos with the total area of 119.5 ha), and 5 zoos are of local importance (with the total area of 312.5 ha).

Three largest zoos of Ukraine (Mykolayiv, Kyiv, and Kharkiv zoos) are members of the European Association of Zoos and Aquariums (Fig. 2.1). The Kyiv Zoo is a permanent full member of this association. The Kyiv Zoo has a Center of zoological information of the EAZA representation in Ukraine.

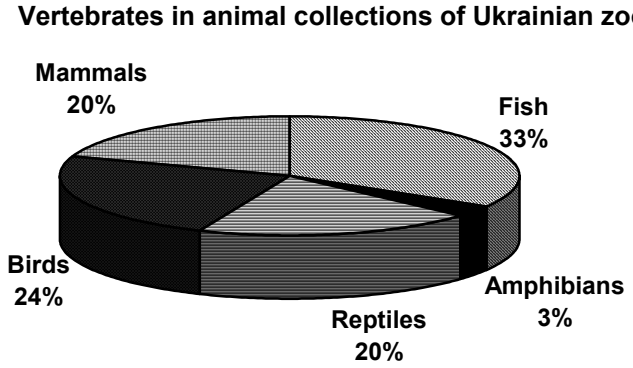
The Ukrainian Association of Zoos and Aquariums (UAZA) was established in December 2001. The members include Kyiv, Mykolayiv, Odessa, Rivne, and Yalta zoos, as well as the Sevastopol Marine Aquarium-Museum.

Table 2.5. List and Characteristics of the Largest Zoos of Ukraine

#	Name and location		Founded in	Area	Number of employees	Number of animal species and their population						
						Invertebrates	fish	Amphibious	reptiles	birds	mammals	Total
	Zoo-biosphere reserve "Askaniya-Nova	Askaniya-Nova, Kherson.	1885	61,1 ha		—	—	—	—	78/10738	39/781	117/11519
	Akhtyrka zooexatorium	Akhtyrka, Sumy Region	1991	633,1м^2	10	No data						
	Donetsk Zooexotarium-minizoo	Donetsk region	1992	100 м^2	2	30/–	—	15/110	54/216	—	8/69	107/395
	Kyiv zoo	Kyiv	1908	34,4 ha	285	27/275	77/669	4/9	36/90	127/847	86/330	357/2220
	JSC "Bion-Terarium Centre"	Kyiv	1990	600 м^2	26	2/3	—	2/4	55/1605	—	6/11	65/1623
	Lugansk zoo and park of culture and rest	Lugansk	1981	0,8 ha	7	—	—	—	2/2	23/57	18/36	43/95
	Lutsk zoo	Lutsk	1995	4,2 ha	17	No data						
	Mena zoo	Mena, Chernigov Region	1997	9 ha	35							100/300
	Mykolayiv zoo	Mykolayiv	1901	18 ha	239	6/65	105/1382	12/67	43/186	106/683	105/427	377/2810
	Odessa state zoo	Odessa	1922	6,5 ha	98	—	96/555	7/74	29/143	58/390	40/191	230/1353
	Rivne state zoo	Rivne	1982	11,6 ha	42	10/–	28/292	4/30	29/80	35/191	36/99	142/692

	Sevastopol marine aquarium-museum	Sevastopol	1897	850 м^2	26	15/221	108/ 1215	1/2	10/14			134/1452
	JSC “Lacerta”	Kharkiv				30/–		3/–	17/–			50/–
	Kharkiv state zoo	Kharkiv	1895	15 ha	155	1/30	136/5555	2/45	45/158	95/669	75/263	354/6720
	Cherkassy local zoo	Cherkassy	1979	4 ha	20					97/688	24/72	121/760
	Small enterprise «Fairy tale»	Yalta, AR Crimea	1995	3 ha	15	—	—	—	3/5	26/304	38/129	67/433

Collection of animals and state of populations. In 11 largest collections available at zoos of Ukraine (See. Table 2.5), there are 1,130 species of vertebrates (292 fish species, 286 amphibians, 171 reptiles, 208 birds, and

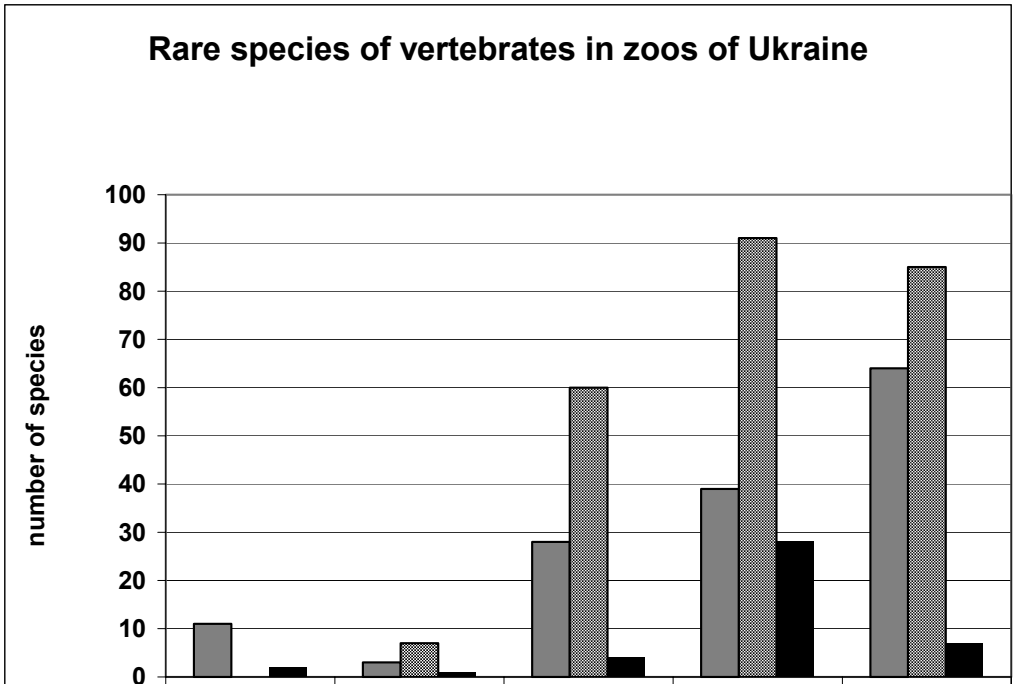


173 mammals) with the total population of 30,000 individuals (Fig. 2.1).

Fig. 2.1. Ratios of species of various classes of vertebrate animals in zoos of Ukraine

Composition of animal collections at zoos of Ukraine was analyzed from the viewpoint of availability of rare species of the Ukrainian and world fauna. In total, Ukrainian zoos have 187 rare species (16.5%) of vertebrates, of which 42 species (4%) are listed in the Red Data Book of Ukraine (1994) and 145 species (13%) are included in the IUCN Red List (1996 *IUCN Red List of Threatened Animals*). Among them there are 25 species under the threat of extinction (categories *EW, CR, EN, VU*), 16 species are classified as belonging to Lower Risk (LR) or Data Deficient (DD) categories.

243 species of vertebrates, or 21.5 % of the total number of species contained in zoos of Ukraine, are listed in Annexes I–III of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973) (See. Fig. 2.2).



	Риби	Амфібії	Рептилії	Птахи	Ссавці
IUCN	11	3	28	39	64
CITES	0	7	60	91	85
ЧКУ	2	1	4	28	7

Fig. 2.2. Number of Rare Species of Vertebrates in Collections of Ukrainian Zoos

An important index of the state of a population of wild animals *ex-situ* is number of species breeding in captivity. In zoos of Ukraine, about 250 species of vertebrates (67 species of fish, 6 amphibians, 41 reptiles, 64 birds, and 72 mammals) are annually reproduced. Under Ukrainian zoos conditions, 8 species of vertebrates included into the Red Data Book of Ukraine (5% of the total number of the "red-book" species of vertebrates and 19% of the total number of species of the "red-book" species contained in zoos) reproduce. 41 species are included into various categories of the IUCN Red List (28% of the total number of IUCN registered species kept at zoos of Ukraine) (Fig. 2.2).

Various approaches to formation of collections of animal species in the Ukrainian zoos and experience gained by them in maintaining certain groups of animals led to scientific specialization of the zoos. For example, the Odessa Zoo is specialized in keeping and breeding of rare animal species typical for the southern part of Ukraine. This zoo also has a special breeding facility for rare birds of prey. The Zoo of Askaniya-Nova Nature Reserve is specialized and has good experience in keeping and reproducing of many rare species of hoofed mammals, terrestrial and some natatorial birds. A small zoo is also functioning at Yelanetskiy Steppe Nature Reserve. JSC "Bion Terrarium Center", JSC "Lacerta" and Donetsk zooexotarium maintain collections of exotic and rare species of amphibians and reptiles, and invertebrates. Considerable number of rare species of amphibians and reptiles are kept in some collections of youth centers and specialized

companies, which are not covered by the present report.

Integrated analyses of many parameters of the zoo network development in Ukraine, peculiarities of formation of zoological collections, legal basis and international cooperation of zoos in nature protection, as well as long-term experience makes it possible to define principal gaps and obstacles on the way to a better *ex-situ* protection of threatened species and possible approaches to eliminating the threats. Principal drawbacks in planning and formation of zoological collections and nature conservation activities of zoos are the following:

— lack of any integral strategy and/or action plan for zoos of Ukraine in respect to conservation of representative species listed in the Red Data Book of Ukraine and absence of national programs of captive breeding of species;

— insufficient level of presentation of zoo collections of regionally rare species of animals, rare species of invertebrates (mainly species used as animal feed are kept) due to insufficient coordination of the zoo network in Ukraine and their nature conservation activities;

— representation in zoo collections of many species only by individual specimens or by non-established pairs, and poor (unclear) genetic definition of many species and groups of animals;

— absence in the network of zoos of Ukraine of specialized facilities (centers), which would carry out rehabilitation (or probably even re-introduction) of wild animals, which got into bad situation or temporary lost their ability to survive in natural conditions.

2.1.3.3. Seed banks and biodiversity conservation

Seed banks is a relatively new method of conservation of plant biodiversity, which so far has not been widely used. The objective of seed banks is not to replace natural populations of species but to act as a kind of "insurance deposit" to secure, when needed, renovation of populations of certain species *in-situ.* Such banks make it possible to renew a population with relatively low expenditures and to provide conservation of large populations with minimal genetic erosion. This method is especially important for those species, which are subject to a serious threat of extinction under natural conditions. As to biodiversity conservation itself, genetic banks as a whole and seeds depositories in particular are considered as a necessary preventive method to be applied in general practices of biodiversity conservation.

Since 1993, Ukraine also joined the countries, which have seed banks for protection of their native biodiversity. Specially equipped seed storage facility, used for long and medium term storage of seeds, operates at the National Center of Genetic Resources of Plants of Ukraine. It is affiliated with the V.Y. Yuryev Institute of Genetics and Selection (Kharkiv). This facility contains 22,600 samples of domesticated plants and 123,100 samples of plant species, cultivars, lineages, clones, and other sources and media of genetic information.

Species of the natural flora, including those under the threat of extinction, are

absent in the national seed bank. The same is true for animal species. Using this facility does not protect threatened species of the natural biota. As for 2003, Ukraine does not comply with the principle of maximum coverage of biodiversity through depository storage of germplasm and through application of preventive measures in respect to threatened components of the biota. Currently, this depository contains only 4% of the total species composition, representing vascular plants present within the territory of the country.

In political statements and action programs adopted by Ukraine in respect to conserved storage of germplasm, there is a tendency to achieve world standards. However, in practice, implementation of this task and its financial support needed for its developing and proper functioning of required infrastructure faces considerable problems.

If we take into account that Ukraine started developing its national system of conserved storage of genetic information media (carries) only in 1993 (that is, 10 years later than some other countries), the progress in this field achieved by the country under conditions of the current economic crisis can be considered as a substantial one. The country carries out reasonable policy of borrowing the experience gained so far in other countries and its reasonable adaptation to the national economic potential and practical requirements.

This country so far has not yet established a system of improvement of reliability of species conservation by securing duplication of the whole species fund or some of its individual components to prevent their loss as a result of possible military conflicts as well as natural or technogenic catastrophes. Only in respect of agricultural crop species, some partial work has been started in order to establish duplicating depositories of plant seeds at the Ustimov Agricultural Research Station of the Ukrainian Academy of Agricultural Sciences (UAAS). However, this facility is located in unsuitable premises and does not meet appropriate requirements. The seed storage bank currently operating in Ukraine does not meet world standards and practical requirements according to the level of its technical equipment, structure, and potential.

The existing system for conserved storage of different objects of plant and animal kingdoms is a financially demanding matter, the costs of establishment of which (construction, purchase of equipment) requires about UAH 9 – 11 million. Therefore, it is not wise to solve this problem in respect to agricultural crops, domestic animals, and threatened species of the native fauna and flora by establishing individual depositories for each of them. It would be more appropriate to establish a combined storage having different departments. Such division and even narrow specialization are not only justified, but are also necessary for maintenance of a system of “operational” seed banks providing duplicating storage. The costs of equipment and maintenance of such facilities as a whole is much lower than the above-quoted figure.

Availability of depositories for conserved storage of components of the biota of this country is an important condition of national security. Possession of own depository of genetic resources will enable to be independent from other countries in solution of various problems connected with use of natural and man-made resources of the plant kingdom as a basis for human life. Its availability and support will facilitate formation of a positive image of the country and will put it in line with dozens of developed countries,

in which the highest priority is given to solving the problems of conservation of national wildlife resources as part of the world biological resources.

2.2. Use of Biodiversity Components

Obligatory condition for the country's transition towards sustainable development is to conserve and restore biological resources, to manage their non-exploitative use. An important mechanism of regulation as a component of general environmental management system is to establish rules and limits of non-exploitative use of natural resources. Such regulation is implemented via clear mechanisms, especially legislative and regulative ones.

At the modern state of development of national policy of Ukraine, priorities in the field of use of biological resources are being changed toward a complex approach in their use and conservation. Several environmental laws of Ukraine adopted during the past decade show some stability in development of the national legislation in conservation and sustainable use of biological resources and its harmonization with the current legislation of the country.

Issues regulating the use of biodiversity components are best represented in the Laws of Ukraine "On the Animal Kingdom" and "On the Plant Kingdom", in the Forest, Land, and Water Codes of Ukraine, and relevant secondary legislation. Special attention is paid in these acts to conservation of biodiversity of declining and threatened species. For achieving these goals, collection of species resources from natural localities is regulated or limited; methods of restoration of these resources are elaborated, or preservation measures are undertaken, including establishment of nature conservation units, inclusion into the category of rare species or associations at the local, national, or international levels.

2.2.1. Sectoral nature use

In relations of humans with the environment, the non-exploitative or sustainable use of biological resources, especially phytoresources, is considered among the most important principles of biodiversity conservation. The use of phytoresources in Ukraine is mainly based on two natural plant types, the main and secondary use of forests, meadows and wetlands as sources of natural fodder for livestock. In general, it can be based on traditionally sustainable human activities according to the existing legal acts of land and forestry legislation, and it should take into account economic and financial mechanisms of assessment of their costs.

Compiling the cadastres of the flora and fauna is the first step toward an integral biodiversity inventory. For achieving that goal, there is an institutional need to finance scientific researches at the populational level of biodiversity indicators and to study the most adaptive populations resistant against anthropic factors, for their practical conservation.

2.2.1.1. Forest resources of Ukraine: state and ways of transition towards principles of non-exploitative forest use

The Earth Summit (Rio de Janeiro, 1992) changed the views on relationships between humans and forests and put at the first place the environmental significance of forests in the modern society. Among adopted important environmental agreements, the following documents were signed at the Conference: Convention on Climate Change, CBD, and Declaration on principles of Global Consensus concerning Sustainable Use of Forests. Forest ecosystems are considered first as a main biosphere component, able to stabilize and restore its natural equilibrium. In Ukraine, the problem of forest use and restoration according to the principles of sustainable development became of the paramount national significance. Reaching the optimum percentage of forested areas will promote an effective system of environmental rehabilitation, help to overcome the misbalance of development of Ukraine in the environmental and economic fields.

Different natural zones of Ukraine have different percentages of forest areas. In Polissya, it is 27%, in forest-steppe — 13%, and in the steppe zone — 4%. In total, the average percentage of forestland for Ukraine is 15.6% (as for 01 January 1996), which is among the lowest values for the European countries. Comparing to average European values, our country has one of the lowest levels of forest provision – only 0.18 ha of forest per capita (Table 2.6). Ukraine, as well as Great Britain, the Netherlands, Spain, Italy, belongs to forest-deficient countries, and should direct its forest policy mainly at restoration of forest resources.

Factual percentage of forestland of Ukraine is insufficient, and in many administrative regions (oblasts) it is dangerously low. For example, percentages of forested areas in Mykolaiv, Kherson, Odessa (Odesa), Kirovograd, Donetsk, Poltava, Ternopil oblasts, and the Autonomous Republic of Crimea are almost 1.5-2 times lower than the optimal one. Therefore, the primary task of forest policy in the regions is to expand forested areas.

Table 2.6. Forest Resources in Europe

Region	Total area, thousand ha	Forest area, thousand ha	% of forestland	Area of forest per capita, ha
Europe in total	2260128	933326	41.3	1.3
Northern Europe	112329	52538	46.8	2.8
Western Europe	245569	59479	24.2	0.2
Eastern Europe	1902230	821309	43.2	2.4
Ukraine	60355	9400	15.6	0.2

Forestry activities conducted in the forests of different levels and categories of protection do not differ much by their content and technologies. It can be explained by the fact that each year, the principal difference between nature-conserving functions of different groups increasingly diminishes.

Practically all forests in Ukraine have water-conserving and soil-protective functions; they also have sanitary-hygienic and recreational significance; they, to some extent, satisfy the needs of national economy in timber, though, of course, the importance of these functions under different conditions is not the same. Therefore, in most cases, the forest-economy activities conducted in forests of I and II groups suitable for exploitation do not differ in principle. Only in the first group cuts are done somehow later. In general, it is reflected by forest assessment indicators of the pine and oak forests most widespread in Ukraine.

The analysis of the given data shows that during the last 30 years the general tendency of change of average resources of oak and pine forestland, which belong to different groups, has many common features.

A complicated system of forest classification by functional peculiarities, which was inherited from the former Soviet Union and which does not have any analogues in Europe, makes it difficult to improve the system of management in forests at the typological and program-goal basis. On the other hand, it does not fully correspond to modern approaches to forests as a multifunctional system.

Subdivision of areas of main forest types by age groups is characterized by significant irregularities and misbalance. For example, young and middle-aged forests cover 31% and 45% of the total forest area, respectively; pre-mature forests — 13%, mature and old ones — only 11% of the total area. In pine forests, the irregularity of age distribution of trees is even more contrasting. Young forests grow at 44.3% of the area, middle-aged trees — at 38%, pre-mature ones — at 13.4%, and mature and old ones cover just 4.3%. In Zaporizhya and Mykolayiv regions, only young and middle-aged pine trees grow; there are no pre-mature and mature pine forests at all.

Analysis of forest use and management in the Ukrainian forests based on principles of sustainable development of forests and their management reflects the existence of sharp differences at different territories. Table 2.7 provides annual fellings in the Ukrainian forests from main timber harvesting and forest management felling.

Table 2.7. Amounts of Felling (Timber Harvesting) in the Forests of Forest-Processing Enterprises of Ukraine

Parameter	Unit of measurement	Year				
		1980	1990	1995	1998	1999
Calculated potential amounts of main timber harvesting	Thousand m^3	397	6 000	5 165	298	268
Actual fellings (timber harvested)	thousand m^3	648	5 799	4 669	341	415
	%	05	9 7	9 0	2	4

Timber harvested through management and improvement felling, and other felling types	thousand m^3	218	7 650	5 600	533	292
Total timber harvested	thousand m^3	3866	1 3449	1 0269	874	707

The data presented show that fellings (timber harvesting) in Ukrainian forests, as one of the indicators of sustainable development, does not exceed the value of calculated potential main harvesting of timber. During the past years, final (or main) timber harvesting provided 10–16% less timber than it was envisaged by calculated values. The amounts of timber received from management felling, sanitary and other cuts, decreased almost twofold. If in the 1970–1980s, in total, timber logged made up 13–15 million m^3 per year (Ukraine needs 35-40 million m^3 of timber), then during the past years it was less than 9 million m^3.

Ukraine's forests experience constantly high impacts of adverse factors. They are connected with natural disasters of the past years, consequences of the Chernobyl catastrophe, industrial pollution, recreational overloading at forest ecosystems, and probably also global climate changes.

Regions of environmental crisis (environmental disaster areas) include southeastern regions of Ukraine (e.g., ecosystems of Donbass). There, in a highly urbanized and industrially developed region, almost 40% of soils of Ukraine destroyed by the industry are concentrated. The powerful technosphere includes about 900 of large enterprises of mining, metallurgical, chemical, construction, and machine-building industries. About 300 mines are operating; as a result, over 24 thousand ha of agricultural lands are disturbed. Waste dumps (waste banks and terrace of opened soils) cover 25 thousand ha, out of which 4.3 thousand ha is wasted and should be recultivated.

There is urgent need to elaborate quantitative criteria of the quality of maintenance felling, as well as acceptable loads on forest ecosystems, caused by the use of machines and mechanisms in forest management activities. Under modern conditions, there is an anachronistic situation, when the average resources (stock) of mature trees in general in the State Forest Fund is lower than the stock of pre-mature ones.

It is necessary to review the attitude toward the current Ukrainian system of sanitary cuts (improvement forest felling). Sometimes they are conducted in unacceptably large amounts and with delays, when wood has already lost its technical qualities. According to the modern international environmental views, cutting of dry and substandard trees is not always appropriate because it often decreases the forest biodiversity and limits or hampers the development of other components of forest

ecosystems.

Special attention should be paid to the fact how appropriate the forest-restoration felling practice is; according to forest legislation, such felling types are conducted in the forests excluded from exploitation, which loose their environmental protective functions.

The share of artificially created forests in Ukraine increases. In 1961 their area was 27% of the total area of the forest fund, but now it is more than 48%. The State Forest Fund of Ukraine already has almost no natural stands of pine and oak younger than 40 years. It is known that naturally grown trees are more valuable and more sustainable, especially under conditions of progressing urbanization. Uncontrolled decrease of the share of natural forests can lead to negative consequences already in the next 20-30 years. The main causes of this are as follows:

— gradual decrease of the age of main cuts (main timber harvesting) during the last 100 years. Older ages of cuts in the past has promoted a much better fruit and seed production of trees and, consequently, more active processes of their natural restoration;

— ignoring in the process of management of gradual and selective systems of main cuts. In lowland forests of Ukraine, only total timber harvesting are conducted in reality, after which forest plantations are established in most areas;

— increase of the anthropic impact on all components of the environment. To a large extent, it leads to transformation of environmental conditions, and also disturbs the mechanism of self-regulation of forest biocenoses and even somehow changes biological features of tree species.

International criteria of sustainable forest management take into consideration the need to conserve forest biodiversity, to enforce ecological aspects in the forest use. They can be promoted by a wider introduction of the forest management practice of gradual, selective and combined types of cuts with improved and progressive technologies. It is necessary to form or promote natural stands of main tree species at least at 10–15 % of the lowland part of Ukraine, and at 60–70 %, in its mountain part. It requires introduction of cardinal changes in and additions to the acting “Rules of Main Timber Harvesting in Ukrainian Forests".

Therefore, the modern state of forest economy shows urgent needs to elaborate new backgrounds of the environmentally sound forest use, which would take into consideration the need of the differential and purposeful use of forests, increase of their sustainability, and enforcement of their environmental functions.

2.2.1.2. Use of biodiversity in the agricultural sector

In Ukraine with its high level of plowing and agricultural land-reclamation, one of the main pre-conditions of the agrosphere development is safe existence of all living creatures, including humans, in agrosystems. Assessment of any physical, chemical or other aspects of the human impact on the environment does not have any sense without knowing their consequences for biotic systems of different levels – from molecular-genetic up to the ecosystemic and biospheric ones.

Conservation of biodiversity, especially phytobiotic diversity of segetal ecosystems, is a base for functioning of agricultural systems, support of their balance, and provision for food production and food safety. All populations of species in segetal communities are components of anthropically altered ecosystems, which are widespread in Ukraine; they, together with semi-cultivated ecosystems determine functioning of the modern biosphere and the general state of the environment. Diversity of the spontaneous (native plus effectively naturalized) phytobiota as a biodiversity component is Ukraine's natural heritage, which should be conserved for the benefit of the present and future generations.

The composition and structure of the segetal phytobiota are significantly affected by relevant anthropic factors: ancient agricultural traditions, agricultural systems, modes of soil tillage, types of cultivated plants, as well as different types of pollution from non-agricultural sources, transport, economic relations, etc.

Therefore, the main task of conservation of the phytobiota of segetal ecosystems is to slow down its man-caused transformation, which became apparent in depletion of the composition of local species, invasions and dispersal of alien species, and evolutionary transformations of both native and alien species under conditions of chemical and physical pollution of the environment.

The total list of invasive vascular plants registered in agrolandscapes or other landscapes of Ukraine, including such anthropic sections of ecosystems as semi-natural (pasture and other grassland classes), transformed (field, plantation, and phytomeliorative classes) and related ecotechnical (residential, road, and mining classes) ecosystems, reaches about 800 species from 365 genera and 87 families.

Article 8h of Biodiversity Convention states that each Contracting Party shall, as far as possible and appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.

Management and organization of plant protection is conducted by the State Service of Plant Protection of the Ministry of Agricultural Policy of Ukraine and State Service of Plant Quarantine of that Ministry. The Law of Ukraine “On Plant Quarantine” (1993) defines general legislative, organizational and financial-economic basis of plant quarantine activities as well as some notions and terms. In particular, a quarantine object is a pest, a pathogenic organism or weeds, which is absent or limitedly distributed in Ukraine, but it can significantly harm plants or plant production. The Ministry of Agricultural Policy defines the list of quarantine objects. Ukraine has an acting “List of Pests, Plant Diseases and Weeds of Quarantine Significance for the territory of Ukraine”, adopted on 19 June 1992 (now it is under revision, and a new version is being prepared). The list includes 166 species, including 53 species of quarantine plants (weeds); in particular, 20 species of external quarantine. Species of internal quarantine are subdivided into two groups: limitedly distributed in Ukraine (8 species) and potentially dangerous species in need of further studies.

2.2.1.3. Biodiversity Conservation Issues in Fishery

Fishery is one of the oldest forms of the nature use, which is related to the exploitation of some groups of biodiversity, in this case, mainly the ichthyofauna of reservoirs.

Traditional fishery management in Ukraine is now concentrated in inland and marine bodies of water, where fish is caught at commercial and amateur levels. Its character has changed depending on technical transformations of natural reservoirs, which became especially large-scale from the middle of the 20th century. According to its impact on the environment, fishery can be compared to forest felling, plowing of virgin soils, and consequences of technical progress. This progress involved both commercial and amateur fishery.

Amateur fishing and fishing sport activities are quite actively conducted during summer and winter seasons. The starting date for catching fish with devices used in the period of open water or from the ice cover depends on a geographical location of reservoirs and intensity of warming of their water mass or appearance of the ice cover. The period of open water is longer in the southern reservoirs of Ukraine and shorter in northern ones; at lakes and water reservoirs, it is shorter than in rivers.

Numbers of some marine and freshwater fish species have decreased due to over-catchment and violation of their living conditions, which lead to loose of industrial value of fish – they become endangered, rare, vulnerable etc. Consequently, the Red Data Book of Ukraine includes 32 species and subspecies of the class *Actinopterygii* and two ecologically similar species of lampreys (*Cyclostomata*), some species of which will soon probably disappear in Ukrainian bodies of water (Shcherbukha, 2002). The list of fish, which will be included soon into the Red Data Book of Ukraine, grows. The Red Data Book of the Black Sea includes 41 fish species (Zaytsev, 1998). Therefore, diversity of native fish species of Ukraine is decreasing.

At the same time, reservoirs of Ukraine are 'enriched' by introduced and naturalized species of fish, among which there are not only economically valuable species, but also such fish species, which cannot be considered valuable additions to the fish diversity of Ukrainian reservoirs. Some species of the latter group overcompete local fish species, decrease their numbers, or even cause their total extirpation. Such alien species are usually deliberately introduced by humans, often from other continents. There are cases when undesired alien species were brought together with valuable ones. For example, the fish species *Pseudorasbora parva* was unintentionally introduced to natural reservoirs together with valuable Far Eastern phytophagous fish species. There were some efforts for developing methods to limit the number of such unwanted species in natural reservoirs, but these methods are not practically applicable. It is clear that it is necessary to find ways of practical use of such species, as any other fish species of natural reservoirs, because they are already a part of the local ichythyocenoses (fish communities). Actions aimed at preventing invasions of alien species and limiting their impact on fisheries are too expensive, but they should be conducted if one wants to get market fish of high quality.

Establishment of the Dnipro water reservoirs led to the need of fundamental re-organization of fishery in connection to getting information concerning diurnal fish migrations. For this purpose, a special pelagic 15-meter trawl was developed. There are

many other original fish catchment devices. However, according to results of daily control of the use of their different types in six Dnipro water reservoirs and the Dnipro-Bug estuary, for instance during 1978, fixed nets with the mesh size 70–85 mm were dominating (they were used for 1440 days), next were fixed nets with the mesh size 30–40 mm — 1020 days, 90 mm and more — only 130 days, 50–60 mm – 100 days. Floating nets were used in the water reservoirs during 280 days. Fish was caught by vyater 260 days, except in the Dnipro water reservoir. Fine-mesh nets were used for 240 days, except in the Kremenchug and Kakhovka reservoirs, sealskin nets — 110 days, except the Kyiv and Dnipro reservoirs. However, sardelle trawls were used in all water reservoirs during 610 days. Therefore, the above data shows the intensity of use of various fishing devices, among which nets dominate, during a year.

Due to the use of some portion of water runoff of the Don and the Kuban rivers for irrigation, the process of salinization of the sea and alteration of its biocenoses has increased. Freshwater fish species have moved to the middle and upper parts of Taganrog Bay. Their best spawning places were destroyed, and fish reproduction was thus disturbed. Changes in hydrological conditions led to the increase of numbers of sardelle, which allowed increasing its catch in 1970 up to 1.225 million centners, while the total catch of all fish species was 1.4 million centners. Before 1974, the average fish catches in the Sea of Azov decreased to 1 million centners. In other words, as a result of over-regulating of water discharge of the Don and the Kuban rivers and increase of pollution of the water area, the fish catch loss reached 2 million centners, including such fish species as zander, bream, *Vimba vimba*, etc.

Amateur and sport fishing is a special field of the use of Ukraine's ichthyofauna diversity. It is subdivided into recreational (when fishing is mostly a recreational activity) and consumer (when fishing is the main or additional way of subsistence or earning for living) types. However, there are no studies in Ukraine devoted to social and economic functions of amateur fishing; the scopes of impact of this human activity upon aquatic ecosystems and their biota are not identified.

Types of devices for amateur fishing are regulated by the relevant "Fishery Rules". There are many problems connected with fishery organization, especially the sustainable use of fish resources, free of charge as well as licensed catchment of some species, prior which special laborious work to fill water reservoirs with "attractive" fish species for amateur and sport fishing should be conducted. There are many opportunities for special breeding of some fish species, even those listed in the Red Data Book of Ukraine, which can be used for economic purposes, where their number is at the defined level. They include also some species, which can have not only potential but also real economic values. Therefore, in international priority-setting practice, the latter have advantages as compared to the first mentioned taxa. In amateur and sporting fishery, there is a problem of how to avoid catching of small-size fishes, for example, young growing breams, which especially actively bite in winter. Therefore, it is important to conduct active education actions, so that each fisherman feels himself as a caring master of that resource provided by nature. The precept "if you caught it – set it free" should work for him in proper moments.

It is clear that fish management problems include the problems of decrease of numbers of fish due to various reasons beside fishery; for example, mass washing of fish

out of water reservoirs. In winter, various fish species are washed via penstocks; their number especially increases due to oxygen deficit. In spring, fish is washed during letting surface waters out via weirs, in summer – due to work of pump stations of irrigation systems. Somehow the scales of these phenomena in the water reservoirs of Ukraine are almost not mentioned and not taken into account. In the same time, in 1964, about 20,000 centners of fish passed via penstocks and weirs of the Tsimlyanska Hydroelectric Power Plant erected on the Don River (Denisov, 1969). Fish losses are not lesser at the Dnipro Hydroelectric Power Plant. Large numbers of fish from water reservoirs is washed out to irrigation systems (Probatov, 1974).

From the 1960s, new catchment devices, using electric current, started to be used in practical fishery. Now commercial fish resources in almost all water reservoirs of Ukraine are nearly exhausted; decades are needed to restore them.

It is clear that it is time to adopt the Law of Ukraine "On Fisheries and Fish Management", which grounds the sustainable use of fish diversity of natural and artificial reservoirs of Ukraine based on a clear strategy and tactics of the management of inland bodies of water for various purposes. It should also regulate relations with water consumers and define main water consumers, who, besides everything else, would be responsible for the state of fish diversity of water bodies. In addition, a complete inventory of water bodies as well as a fishery cadastre of water bodies of Ukraine (qualitative and quantitative description of the ichthyofauna with its ecological and socioeconomic assessment) should be conducted for the fishery purposes.

2.2.1.4. Impact of Hunting on Biodiversity Conservation

Hunting is a special field of human activities, which unites nature conservation with traditions and values of the nature use. The level of hunting management depends on the state of economic and cultural development of the country and is a conspicuous element of biodiversity conservation.

The total area of hunting grounds in Ukraine cover 47,721,600 ha, or 79% of the total area of the country. Nevertheless, low-efficiency hunting management leads to certain problems, which negatively affect the state of game animals.

According to statistic data (Table 2.8), the level of hunting for ungulate animals (licensed species) is very low in Ukraine. At the same time, total numbers of animals constantly decrease. For example, moose (European elk) numbers in 1991 were estimated at 14250 animals, and in 2001, just 4490 animals. For comparison: in Germany, which is twice as small as Ukraine by its area, during several years the numbers of roe deer stabilized at the level of 1.5 million animals, and those of wild boar, at 600,000 animals. It allows bagging annually 1 million roe deer and 400,000 wild boars, which makes up to 66.7% of their total number in both cases. We believe that such a

comparison shows a low level of biotechnical and conservation measures in hunting management, as well as, most probably, the unreliability of statistical data of primary sources of information.

Table 2.8. Number and Game Animals Bagged in Ukraine in 2001

Species	Total number	Animals Bagged		Optimal level of hunting (in %)
		heads	% of the total number	
Moose (European elk)	4490	3	0.07	10
Noble deer	13092	125	0.95	10
Roe deer	118740	2443	2.06	15
Wild boar	36026	1986	5.51	30

Increase of hunting culture and the level of hunting management envisages the establishment of additional jobs and increase in the employment level of local population.

Hunting management is quite a complicated independent management field like agricultural, forest, meliorate, fishery, and municipal sectors and the Ukrspozhyvspilka (Ukrainian Consumer Group), which are interrelated as subjects of the nature use.

A very promising and topical direction of the Ecological Network development in Ukraine is presently the use of the potential of hunting grounds for biodiversity conservation, because the total area of state hunting and forest-hunting lands (now Ukraine has about 75 units of hunting areas) exceeds 5-6 times the whole area of the Nature Conservation Fund. Sizes of each unit are dozens of thousands of ha of land, and natural ecosystems are well conserved there. The main resources and species diversity of game and non-game animals are concentrated at these territories. Even a larger part of total numbers of 'Red-Book' species, especially those requiring large areas for forming of stable micropopulations (sub-populations), is concentrated at hunting lands.

An important institutional need, which is difficult to meet under the current socioeconomic conditions in Ukraine, is to establish a state hunting inspection independent from a specially nominated hunting management authority.

2.2.1.5. Biodiversity Conservation: Recreational Aspect

Increase of recreational areas is an influential factor for restoration of natural environmentally sustainable biogeochemical chains and biocenoses as basic structures of biodiversity. According to the data of assessment of the resource potential of such lands, their area in Ukraine can reach about 15% of its territory. Its is twice more than the areas used for these purposes nowadays. Besides biodiversity conservation, these lands can also perform

other functions. According to prognostic calculations, using of that potential gives an opportunity to improve the health standards of about 50 million people (nearly the whole population of Ukraine). On the other hand, it is a powerful potential for developing international tourism, which is a profitable sector of national economy in many countries of the world. For example, the specific share of profit from tourism in GDP of Spain is almost 4 %, in Cyprus — about 20%, and in CEE countries – about 7.6 %. In Ukraine, the share of such profit is not more than 1 % yet.

During the attempt at optimizing the structure of the local recreational natural system, Ukraine faces the following situation: demand for all types of recreation in conditions of free selection of sub-systems (under unregulated selection of recreational activities) cannot be fully satisfied due to an insufficient total area of the systems due to the absence of areas that can be used for such sub-systems. In this case, optimization of the recreational load can be done within the following activities:

— elaborate a well-developed and diverse network of trails, which would organize flows and location of people on vacations with a controlled access to recreational areas;

— give priority to the outgoing type of recreation, except local holidays systems of national significance; holiday recreation is oriented here at other local recreational zones;

— give priority to the use of sub-systems with the largest recreational load, namely parks and forest-parks, then coastal forests etc.;

— decrease peak loads of systems by means of re-distribution of the flow of people on holidays outside the system (to historical and cultural centers, to protective agricultural belt, to neighboring systems, which are coordinated with the given system by their functioning).

With time, taking into consideration the significantly increased migrations of people on holidays, loads on ecosystems can be tremendous. Therefore, there are the following urgent needs:

– elaboration of a national concept of the recreational nature use;

– development of the ecotourism infrastructure;

– increase of the control by state environmental services over the owners of areas with large recreational potential;

– development, together with environmental NGOs, of different informational resources concerning environmental values of recreational zones and requirements to their use.

There are no special state decrees concerning the development of ecological tourism in Ukraine, but this direction is always mentioned among the priorities in the decrees on tourism development in our country, especially concerning creating incentives for local initiatives in developing internal and foreign (international) tourism. Key documents in this aspect include the Decree of the Cabinet of Ministers of Ukraine (No. 728 of 29 April 1999) "On Activities for Further Development of Tourism", where special attention is paid to the need of establishing regional (oblast-level) structural tourism subdivisions for its local development, especially by means of new thematic

excursion programs and special routes, including environmental trails, elaboration of a complex program of sports and health-improving tourism for children and youth. There is also the Decree of the Verkhovna Rada (Parliament of Ukraine) (No. 2068-III of 02 November 2000) "On Conclusions of Parliamentary Hearings about the State and Perspectives of Tourism Development in Ukraine".

The adopted State Program of Tourism Development in Ukraine for 2002–2010 (hereafter, the Program) states the need to find additional resources for developing innovative tourism products and to conduct measures in order to provide ecologically acceptable scales, rates and territorial proportions for tourism development in well-known tourist centers, and especially in potential ones. Thus, it is necessary to conduct complex landscape and environmental, historical and cultural researches of the territory of Ukraine and define differentiated norms of maximum admissible levels of human loads at tourist objects; to elaborate and implement rules of complying to environmental legislation and legislation on cultural conservation in recreational zones, and to elaborate a mechanism of its strict compliance; define norms and maximum admissible limits of human loads in recreational zones of the objects of tourism infrastructure etc. (Clause 4 of the Program). In general, the Program should promote, on the one hand, establishment of a higher tourist culture and, on the other hand, improve the level of environmental culture of the Ukrainian population, especially by means of tourism.

In Ukraine in the beginning of the 1990s, environmental tourism was understood quite narrowly, as limited tourist activities within national parks, arboreta, botanical gardens, and other similar areas and units. Of course, national nature parks are directly involved in the process of development of ecotourism. With this purpose, buffer zones of nature reserves can be used; any activities, except scientific ones, are legally limited within these areas. Therefore, territories with the best-developed ecological tourism include traditional regions, namely the Carpathians (especially the Chornogora and Svydovets mountain ranges), Crimea (especially Ai-Petri Yayla, Chatyr-Dag, and Karabi Yaila mountain areas). During the recent years, it is also being developed in Podillya and Pokuttya.

Unregulated tourist flows, the absence of clear coordination of this activity (local authorities often do not know tourism routes and numbers of visitors), absence of scientifically grounded norms of maximum loads, absence of even the simplest traditions of proper behavior in the natural environment, and environmentally unfriendly behavior of recreants (littering, cuts and unauthorized fires, graffiti distorting the esthetics of natural landscapes), and, finally, the absence of organizational management of ecological tourism — all these factors lead to economic and environmental losses, including the loss if biodiversity. In addition, all this negatively affects the tourist image of a specific place or area. For example, total timber harvesting (clear-cuts of forests) as well as excessive cattle-breeding at mountain scopes are conducted at the most popular tourist roots (from Lazeshchyna to Goverla and P’etros mountains). They led to a significant reduction of biodiversity, erosion processes, which significantly affect aesthetic values of this territory (especially critical this progress is at the Svydovets and Gorgany mountain ridges). Littering of the most popular tourist roots became a "standard" problem of unregulated recreation. It is especially the case for recreational zones of large cities. There is also a problem with introduction of "fashionable" and pseudo-environmental types of tourism, for example, horse tourism in environmentally vulnerable areas (for example, at Ai-Petri

Yaila in Crimea). Another direction of ecological tourism includes recreational activities in rural areas, so-called rural "green" tourism.

Therefore, preservation and enforcement of traditional knowledge and traditions related to biodiversity conservation by means of tourism and recreational activities are aimed at providing economic benefits for local communities, creating additional jobs, and increasing employment of local population in "alternative economy". This economy is represented by an innovative tourist product based on local resources of ecological tourism (in a wide sense, including local traditional knowledge of the nature use), which will provide additional income for local people without harming biodiversity.

2.2.2. Situation with Biodiversity in Connection with the Impact of Different Branches of Economy: Water Industry Case

River systems suffer from the heaviest anthropic loads, because artificial reservoirs with dams of hydroelectric power plants, cooling reservoirs of thermal and nuclear power plants and utilities, water intake stations of cities and supply channels are located on the rivers or in their catchment areas. Instead of the natural water consumed, large amounts of poorly treated or untreated wastewater with increased toxicity and dangerous mutagenic properties are returned in the bodies of water.

Disturbance of the water regime together with increase in the groundwater (aquifer) levels and other adverse effects are dynamic factors capable of increasing sharply the impact of all man-caused factors on the environment, and finally of defining the general environmental situation in the region.

Regional disturbances of the hydrological regime are especially noticeable in the Dnipro River basin because of large water reservoirs constructed during the Soviet times, which have radically changed living conditions of natural biocenoses in this area. Nevertheless, such a situation lasted already for several decades, and now it does not change rapidly.

It is worth mentioning that concentrations of heavy metals in the water of the Dnipro water reservoirs and general water mineralization grow in the north-to-south direction. This phenomenon is quite natural because the anthropic loading is heavier in the southern regions of Ukraine.

In miming regions of Ukraine, changes of hydrogeological regimes proceed quite rapidly due to shutdowns of mining enterprises. The first experience in closing down non-profitable mines of Donbass shows that this action is accompanied by changes in some parameters of the geological environment.

It is clear that such intense changes negatively affect the fauna and flora of the region, which are already threatened. An important factor here is swamping and underflooding of territories, which is accompanied by raising the aquifer (groundwater

level).

During the last years, western and central parts of the Black Sea area are often flooded, which have catastrophic effects on the cities and settlements of the region. The flooding is mainly caused by unsustainable engineering and management activities in the water environment, which are caused by excessive irrigation, significant water losses from the water supply and sanitation networks, etc. The process is further aggravated by geological conditions – presence of loess strata with good filtration capacities in the vertical direction, which are underlain by thick water-resistant clay beds. It creates favorable conditions for establishment of technogenic 'perched groundwater' (irrigated areas, settlements, water reservoirs etc.). Rapid raise of the aquifer is also related to low natural drainage of the territory, which was considerably altered during the rapid development of irrigation systems and water-transporting canals in coastal and marine zones.

Artificial changes of landscapes led to the raise of the issue of another "gap": some local components of biodiversity are replaced by others, competing ones. For example, intensive growth of air-aquatic plants (reed, cattail, etc.) at shallow waters of the Dnipro water reservoirs, the upper reaches of the Pripyat and its tributaries (for example, the Stokhid River) inhibits the development of planktonic and benthic algae and, consequently, reduces the general biodiversity level of the autotrophic link of water ecosystems.

Purposes of the use of aquatic ecosystems of continental water bodies in Ukraine are often diametrically opposite and mutually excluding. They are usually as follows:

— intake of large amounts of water for communal water supply and various industries and sectors (metallurgy, energy, chemical industry, agriculture etc.);

— non-returnable consumption (usually in environmentally unacceptable amounts) of biological resources, which are integral components of the aquatic biota (algae, higher aquatic plants, invertebrates, fish);

— use of aquatic ecosystem as natural reservoirs for discharge of various wastes, especially wastewater, large amount of which are insufficiently treated and contain a wide range of pollutants.

Therefore, there are urgent needs to test and introduce methodological approaches in environmental activities aimed at mitigating specific threats to biodiversity components for assessing the state of biodiversity under the impact of various natural and, especially, anthropic factors.

2.2.3. Present Status, Use, and Conservation of Non-timber Plant Resources

2.2.3.1. Resource Potential and Use of Herbaceous Plants in Ukraine

There is a clear tendency to degradation of plant resources (phytoresources). It emerged from the fact that synanthropization and the reduction of biogeochemical function become stronger.

The existing system of use of phytoresources was formed under the command-administrative system is ecologically detrimental and economically ineffective. The organizational structure of management, protection, and use of natural plant resources is thus imperfect. Different institutions do not coordinate their activities, and pursue their own, often contradictory, interests.

A considerable share of herbaceous plant resources is located within radioactively contaminated territories. It consists of about 25% gross resources of medicinal plants, which are excluded from use. Resources of bearberry (*Arctostaphylos uva-ursi*) are almost lost because of radioactive contamination. About 70% of resources of bogbean (marsh-trefoil, *Menyanthes trifoliata*), clubmoss (*Lycopodium clavatum*), heather (*Calluna vulgaris*), 60% of bilberry (*Vaccinium myrtillus*), 40% of lingonberry (cowberry, *Vaccinium vitis-idaea*) and bracken (*Pteridium aquilinum*), 30% of erect cinquefoil (*Potentilla erecta*), male fern (*Dryopteris filix-mas*), European lily-of-the-valley (*Convallaria majalis*) and white cinquefoil (*Potentilla alba*) are found on radioactively contaminated territories. About 30-35% of resources of wild edible plants, 15-20% of wild spices and aromatic plants, and about 40% of herbaceous fodder resources are concentrated in radioactively contaminated areas.

Expected losses of herbaceous plant resources within the coming 20-30 years will lead to grave ecological, economic and social consequences. The situation demands developing of new approaches to manage the areas where herbaceous resources are concentrated. Most of these areas are intensively used (agriculture, urbanization, construction of industrial units, etc.) that complicates the process of solving this problem. This disruption of herbaceous plant resources has its high cost from economic, social, and environmental viewpoints. Besides of gene pool deterioration in resource plants, there is a risk of diminishing of their biotope-forming and other functions, which, in its turn, is a threat to the natural basis of Ukrainian population's existence. Taking into consideration the present status of non-timber plant resources, experts propose to revise the ratio between utilization and restoration of phytoresorces at the first stage of transition to the sustainable use of ecosystem resources.

At present, 38.7% of total areas under herbaceous vegetation are intensively used in national economy. It is advisable to decrease this area by 17.4%. At the present stage of development of productive forces of Ukraine, it is expedient to use only 1/5 of the total areas for complete withdrawal of phytomass of herbaceous resources; the remaining areas should be used for restoration of phytoresources.

As for withdrawal of plant raw material, the provision of only 35% of the current scope is optimal. It is advisable to decrease sharply the use of phytoresources of mires (by 76.3%), solonetz, solonchak and other saline habitats (by 93.4%), and steppe and sands (by 95.4%). In the future, at the next stage of transition to sustainable development, it is expedient to increase by 25-30% the usage of freshwater and marine phytoresources. It is conditioned by the need of withdrawal of some part of organic matter for decreasing the processes of anthropogenic eutrophication of water bodies. In the last 15-20 years anthropogenic eutrophication of the Black Sea, and especially the Sea of Azov, become stronger, and stands of eelgrass (*Zostera marina*) have rapidly increased. Partial withdrawal of eelgrass resources will contribute to some improvement of environmental condition. Total areas of eelgrass are 131,000 ha, and nearly 1/2 of these areas are suitable for harvesting of its biomass. The annual harvest could reach 15,374,000 tons of biomass without any environmental damage. Reprocessing of only 1/10 of the potential annual harvest into alginates could 5-7 times exceed the annual demand of the Ukrainian

population. Main areas and resources of *Zostera* are concentrated in Kherson and Zaporizhya regions (oblasts) and in the Autonomous Republic of Crimea.

The main ways of improving the conditions of herbaceous plant resources at the first stage are restoration, re-stabilization and rehabilitation of natural vegetation areas, minimization of contamination and processes of anthropogenic eutrophication and underflooding, regulation of anthropogenic influence, and formation of a network of protected areas. The network should cover up to 10-15% of available areas of herbaceous plant resources.

2.2.3.2. Resources of Medicinal Plants: the Current Status and Use

The issue of utilization of herbaceous plant resources for the needs of Ukraine's pharmaceutical industry and drugstore network is still weakly developed.

At present about 30 species of medicinal plants are harvested in nature for pharmaceutical industry. About 1/2 of them have limited distribution and resources. The number of regions and econiches, where native wild plants are still of some importance as raw material for pharmaceutical industry, is progressively decreasing under conditions of the intensive anthropogenic load on natural ecosystems. Mainly it concerns species with narrow ecological amplitudes. For these species, changes of ecological conditions lead to intensive recession of their population and to insularization. Thus, it is necessary either to regulate strictly or to terminate completely the use of populations of Jacob's-ladder (*Polemonium coeruleum*), sweetflag (also known as sweet calamus, *Acorus calamus*), meadow bistort (snakeweed, *Polygonum bistorta*), and bogbean (*Menyanthes trifoliata*). Restoration of resources of these species is practically impossible because of irreversibility of natural processes arisen as a result of intensive aridization of territories.

For example, sweetflag (*Acorus calamus*) is sensitive to underground water level. On drained areas, sweetflag loses its resource value within one year or two. At that, such vitality parameters as plant height, rhizome thickness, density of stands sharply decline. Solid stands disintegrate into separate fragments that are localized at ground depression zones. Usage of partly drained floodplains for pasturing often complicated already unfavorable ecological conditions. Uncontrolled harvesting on partly drained areas leads to a catastrophic drop of natural resources of the species that is inevitably manifested in dropping yield. Only 17.7 tons of sweetflag rhizomes were harvested in Ukraine in 2001, whereas mean annual harvest for the period of 1977-1979 was 282 tons, and 219.38 tons in 1989 (Table 2.9.). In 1968 the total harvest of sweetflag crude rhizomes was 806 tons. Natural resources of sweetflag in Ukraine are on the verge of depletion. For the last 20 years, resources of sweetflag have decreased more than 10 times. Restoration of the lost natural resources of sweetflag is impossible, and because of that there is a strong need in regulation and control of sweetflag harvesting.

Table 2.9. Harvesting of sweetflag (*Acorus calamus*) by years, metric tons

1989	1991	1992	1994	1996	1997	1998	1999
219.4	111.9	3.3	9.3	2.6	11.6	3.1	1.4

Resources and harvesting of other medicinal plants such as bogbean (*Menyanthes trifoliata*), wild-rosemary (*Ledum palustre* L.), wild-rosemary dried blossoms, mother-of-

thyme (*Thymus serpyllum* L.) and some others have the same tendency. Such situation resulting from the uncontrolled use of medicinal herbs demands urgent solution.

From the mid- 1980s, the tendency of cutting down the usage of medicinal herbs is observed. The main reason for this trend is the observed depletion of natural resources and decline of national processing industry facilities. In 1980, large amounts (about 17,000 tons) of medicinal herbs of 68 species (including 15 cultivated species) were used as raw material for pharmaceutical industry and practical medicine. In 1990 only 60 species (including 17 cultivated ones) were used in the total amount of 10 thousand tons, and in 1999, 44 species (including 17 cultivated) and about 1 thousand tons, respectively.

Large-scale commercial cultivation is one of the ways of preservation of natural plant recourses, particularly medicinal plants. At the beginning of the 1990s more than 85% of gross amount of medicinal plants were gathered in natural plant communities, while in 1999, only 60%. According to official reports of state purchasing organizations in 1999, about 600 tons of wild herbs and ca. 400 tons of cultivated herbs (grown by specialized farms of the *Ukrphytoterapy* consortium) were procured. It is 10 times less than in 1989 and 10% less than in 1998.

According to information provided by the State Scientific Center of Medical Products in 2000, 25 plant species were cultivated at specialized farms of the *Ukrphytoterapy* consortium. It is planned to increase the number of cultivated medicinal species up to 60. Problems in Ukraine's national economy considerably slowed the development of this economical activity.

In the total amount of drugs, the share of domestic phytochemicals is about 25%. Ukraine's national pharmaceutical industry in 1997 produced about 90 plant-based or plant-derived medical products. Their total sale amount was 75 million US dollars. At the same time, the country imported phytopreparations worth 195 million US dollars. These figures emphasize the need of developing both commercial cultivation of medicinal plants and developing national chemical and pharmaceutical industry. Such an approach, from the one hand, will decrease the load on natural resources and biodiversity, and, from the other hand, will contribute to the development of the national pharmaceutical market and international promotion Ukrainian pharmaceutical products.

2.2.3.3. Restoration and Conservation of Grasslands.

Herbaceous plant resources of Ukraine are represented by various types of grasslands: meadows (5.4 million ha), mires (0.60 million ha), *plavni* wetlands (formed mostly by reed communities; 0.96 million ha), freshwater and coastal (1.5 million ha), marine (0.8 million ha), solonetz and saline lands (0.58 million ha) and steppe lands (0.38 million ha). Annual organic matter production on these lands is 29836 thousand tons. Herbaceous plant communities are rich in economically valuable species, specifically fodder (46% of the total number of species), medicinal (23%), technical (12%),

ornamental (72%), edible (13%), melliferous and ceragous (76%) and other plants.

Extensive development of productive forces in Ukraine, the deformed structure of national economy that does not consider consequences of economic activity and does not prevent its destructive effect on natural ecosystems, and excessive use of herbaceous resources have led to their exhaustion. At present, the area of hayfields and pastures is about 7.9 million ha (13.2% of the total area of the country, or 19% of agricultural lands of Ukraine). Average figures for the world are 26.5% and 72%, respectively.

Decrease of the area of grasslands has led to the rapid increase of the antropozoogenic load, essential deterioration of the ecological and economic value of grasslands, and decline of their total productivity.

In 1999 ca. 7958 thousand tons of dry biomass was harvested from grasslands. Gross value of this product in comparative prices of 1996 was 1.307 billion UAH, which is 12.2% of the gross production value of livestock farming. It is 1.9 times less than potential productivity of grasslands.

According to preliminary calculations, the current state of environment and production demands to increase meadow and pasture areas by 7-8 million ha. There are two ways to meet this requirement: exclusion of some portions of intensively cultivated arable lands and creation at these areas of long-resistant cultivated phytocenoses; and restoration of the productive potential of existing grassland ecosystems based on introduction of ecologically safe and energy-efficient technologies for its sustainable use.

Implementation of these measures could sufficiently change the structure of fodder resources, in particular to decrease the share of grass fodder to 45-55%, and the share of pasturable fodder, to 30-35%.

In view of the above, it is necessary:

- to make meat and milk cattle breeding economically efficient (cost-effective) by wide introduction of summer grazing;
- to stop or minimize soil erosion processes through optimizing the agrolandscape structure (by balancing such stabilizing factors as forests, forest belts, natural and cultivated grasslands with such destabilizing factors as arable lands, orchards in 1:1 ratio);
- to improve the species composition and phytocoenotic structure of grassland ecosystems;
- to enrich aesthetic and recreation values of landscapes and their components;
- to improve conditions of water resources of the hydrographic network;
- to create favorable conditions for conservation of valuable genetic diversity of plants and wild animals

Rehabilitation and conservation of grasslands should be based on relevant legislation and should become a part of state policy. Probably it would be advisable to develop a Grassland Code to regulate social relations for grassland conservation, rehabilitation, and its enhancement of their value and productivity. Such approach allows satisfying community needs in plant resources on the base of its scientifically sound sustainable use.

The reduction of areas and resources of herbaceous plant determined by anthropogenic impact is observed during the past 30 years. Wetlands degrade because of drainage melioration, overgrazing, and uncontrolled withdrawal of phytomass. Aquatic

areas suffered due to runoff redistribution and deprivation, anthropogenic eutrophication and pollution, and dewatering. Steppe lands decline because of overplowing, overgrazing, and afforestation of ravine slopes. Solonetz and other saline lands degrade because of overgrazing, irrigation, and underflooding of neighboring areas. A steady decline of phytomass and primary production, drastic reduction of valuable species numbers, decline of the regulatory function of phytoresources (nearly total for halophytic and steppe vegetation, and partial for wetlands) is observed during the last 10 years. The process of land degradation is progressing, which is especially important for steppe plant resources, and, next by its importance, for saline and mire resources.

Application of energy-efficient technologies in fodder industry, mechanization and automation of agriculture, supplying farmers with fertilizers and herbicides will allow to increase the overall productivity of arable lands, to achieve a better balance between natural and agricultural landscapes, to restore species and coenotic biodiversity of natural grasslands, and to reduce grassland erosion.

According to V. Paschenko (1999), plant resources of natural landscapes of Budzhats'ka steppe of Ukraine (Odesa Region), steppe of the Dnister and Dnipro interfluve (Dnipropetrovsk, Kherson, Mykolayiv, Odesa regions), Northern Pryazov'ya (Lugansk, Donetsk, Zaporizhya, Dnipropetrovsk regions), Zadonets'kyi (Starobil'skyi) steppe (Lugansk Region) and natural landscapes of Nyzhn'odniprovs'kyi (Lower Dnipro) steppe (Kherson Region) Prysyvashs'ko-Pryazovs'kyi (Syvash and Azov) steppe (Kherson Region), Crimean steppe (Autonomous Republic of Crimea) are most disturbed or almost lost.

Sufficiently disturbed are coastal zones, barrier beaches, spits and overflow lands in the southern part of Ukraine, especially natural landscapes of the Ukrainian part of Seredn'orus'ky (Middle Russian) area (Kharkiv and Poltava regions), Livoberezhno-Dniprovs'ka area (Kyiv, Poltava, Sumy regions), Dnistrovs'ko-Dniprovs'ka area (Cherkasy, Vinnytsya, Kirovograd, Khmel'nytskyi regions) of the forest-steppe zone, and the Western Ukrainian area (Rivne, Ternopil, L'viv regions) of the deciduous forest zone. Plant resources of Ukrainian Polissya, in particular Chernigiv, Novgorod-Siversky and Zhytomyr parts of Polissya (Volyns'ka, Rivne, Zhytomyr, Kyiv, Chernigiv regions), are less disturbed.

2.3. Acces to natural resources, transfer of technologies, and benefit-sharing

2.3.1. Access to Genetic Resources

Genetic resources of biodiversity include diversity of species within a specific ecosystem, specific territory, and on the Earth in whole. At present about 2.5 million species of plants and animals are known, but this figure is just a rough estimate. Nearly 74% of them are restricted to the tropical zone, 24% – are associated with temperate zones, and only 2% – with Arctic and Antarctic polar and subpolar zones.

Conservation of biodiversity of agricultural species as a main component of agrosystems is a key factor of global-scale conservation of agrobiodiversity. The genetic potential of agricultural species actually determines the capability of systematic selection of animal breeds and plant cultivars in accordance with specific conditions of each agrosystem. Natural product of each plant species is characterized with a unique combination of biologically valuable components, and thus only the great diversity of species could meet the requirements of the notion of "wholesome and salubrious plant food". Moreover, only 15-20 plant species of about 5 thousand plant species cultivated by

humans provide 90% of total plant production, with the main contribution of wheat and rice. There is a tendency to some shrinking of species diversity that weakens the nutrition structure. Such tendency does not allow using different soil-climatic and climatic conditions effectively, and reduces ecological stability of agroecosystems.

Ukraine has strong traditions of agriculture. During the Soviet period, it was the main producer of agricultural products in the USSR. In 1980-1990 the population of Ukraine was 17.9-18.9% of the total USSR population; nevertheless, Ukraine produced 20.8-22.4% of grain; 21.7-27.7% of wheat; 46.2-52.6% of sunflower seeds; 19.5-27.8% of potato; 52.8-58.9% of sugar; 21.8-23.1% of meat, and 22.5-23.4% of milk produced in the USSR.

Decline of gross production is observed under the crisis conditions in Ukrainian agriculture. It is clear that current production values are far from potential capabilities of the Ukrainian agrarian sector. Ukraine has the most fertile soils in the world and could produce much more agricultural products. By raising the crop yield and cattle productivity to the average level of EC countries, Ukraine has a potential of producing 70 million tons of grain, 3.8 million tons of sunflower seeds, 6.5 million tons of sugar, 40 million tons of milk, and 4.6 million tons of meat.

Privatization of genetic resources of Ukraine (for example, by establishing private companies' sperm banks of autochthonous breeds of animals, or seed banks of cultivated plants) is a threat for state management and control of genetic recourses of Ukraine. Creation of the National Center on Genetic Resources could help to overcome the crisis of the use and control of genetic resources. Involvement of scientific institutions specialized in studying genetic components of agroecosystems could help in optimizing the use of genetic resources. For this purposes it is important not only to establish the register of existing genetic resources but also to investigate and describe genetic structures using methods of molecular biology and genetics.

The interest of private companies and state institutions to conservation of genetic material of cultivated and wild plant species is growing. It is understandable, since genetic resources are crucial for selection of highly productive plant cultivars and animal breeds resistant to pests, diseases, and harsh environmental conditions. Possession of such genetic resources is important for ensuring the national food security, and it also determines the status of the country in the field of biotechnology researches.

2.3.2.. Assess to Technologies and Technology Transfer

At present, the agrosphere occupies over 70% of the Ukrainian territory. The situation could not be substantially changed even under essential reduction of arable lands because of transformation of one form of agricultural use into another. If we consider the stable declining trend of natural biodiversity, we should recognize that the agrosphere would be playing the leading role in socioeconomic development of the country in a long run.

During the 1970s and –1980s the agrosphere of most regions of Ukraine suffered from adverse anthropic impact because of gross faults in agricultural practice and development of heavy and chemical industry.

Unfortunately, the process of collapse of the agrosphere in Ukraine and other CIS countries is continuing. In the 1990s, land and agrarian reforms were conducted inconsistently, under condition of political confrontation and without any strategy or clearly defined goals.

At present Ukraine does not conduct any concerted activities regarding its participation in development of environment-friendly technologies of conservation and sustainable use of biodiversity, the environmentally safe use of genetic resources, and use of world genetic resources of domestic animals and cultivated plants within projects initiated and supported by the Food and Agriculture Organisation (FAO).

It is advisable to create a special subdivision of the Farmer Association responsible for information exchange between scientific institutions of the Ukrainian Academy of Agricultural Sciences and the private sector. Such subdivision should encourage the introduction of advanced technologies to the private sector and provide official support to the farmers using new technologies.

It is recommended to create a National Center on Genetic Resources for developing relevant legislation, solving problems of the joint international use of technologies in conservation and sustainable use of biodiversity, and the use of genetic resources without any noticeable harm to the environment.

2.3.3. Advantages of Biotechnology and Sharing Its Benefits

Even now, there is still no scientific or operational institution responsible for monitoring the expansion of genetically modified organisms (GMO) in Ukraine. Some activities for testing of food products and detection of transgenic materials were initiated at the Institute of Hygiene of the National Academy of Medical Sciences. To date this activity does not go beyond the development of necessary material resources (equipment and facilities). Furthermore, GMO testing in food products is only one aspect of the problem, which does not include evaluation of biosafety and ecosafety of transgenic organisms.

The objective of the UNEP-GEF Global Project on Development of National Biosafety Frameworks is establishment of the background for the Cartagena Protocol consummation by providing support in implementing some measures, specifically:

1. Evaluation of existence and abilities of technological potential and prospective analysis to secure national biosafety.

2. Reinforcement of national potential necessary for development of national normative frame documents on biosafety.

3. Strengthening of abilities for competent decision-making, including creation of an administrative system to provide support at the local level:

- verification of information and requests in order to check its reliability;
- risk assessment, including risk management, if appropriate;
- decision making within the bounds of frame regulatory documents;
- development of a feedback mechanism;

4. Implementation of other measures according to the Cartagena Protocol, taking into consideration the decisions of the Intergovernmental Committee for the Cartagena Protocol on Biosafety .

5. Support of regional and sub-regional interaction, including harmonization of national legal systems in that respect.

6. Raising the level of public awareness regarding GMO, stimulation ща thematic discussions, and providing of transparency in GMO regulation.

7. Providing stakeholders the possibility to participate in development of national document on biosafety.

Ukraine has joined the Cartagena Protocol on Biosafety in September 2002 (Law of Ukraine № 152-4 of 12 September 2002). The Cartagena Protocol came into force on 11 November 2003. Since that date, Ukraine is a Party of this Protocol. The Ministry of Environment and Natural Resources is designated as the Authorized Body on GMO issues and is responsible for interaction and coordination with the Cartagena Protocol Secretariat.

CHAPTER 3. BIODIVERSITY CONSERVATION IN UKRAINE: THE PRESENT STATE AND PLANNED ACTIONS

Provisions and objectives of the Convention on Biological Diversity are immediate constituents of regulatory and legal, financial and economic, institutional and organizational aspects of national ecological policy.

Depending on their content, five sets of regulatory and legal acts could be defined within the legal framework of biodiversity conservation in Ukraine:

1. Legal acts that specify principles of the national legal system, ways of solving of socioeconomic and other problems essential for conservation and sustainable use of biodiversity. This block includes the Constitution of Ukraine, legal acts on activities of national and local executive bodies, local government institutions, budgetary, taxation, industrial and business activities, urban and territorial development, administrative and criminal amenability and liability, and documents of civil legislation.

2. Legal acts that regulate legal and jural relations in regards to maintaining environment conditions favorable for conservation of biological and landscape diversity. This block includes Laws of Ukraine "On environmental protection", "On the atmospheric air protection", "On ecological expertise", "On wastes", "On geological service", the Land Code, the Water Code, the Forest Code, and the Mineral Resources Code.

3. Legal acts that directly regulate biodiversity conservation, namely the Laws of Ukraine "On the Nature Conservation Fund", "On the Animal Kingdom", "On the Plant Kingdom", "On the State Program of Development of the National Ecological Network of Ukraine for the period of 2000-2015", "On the Red Data Book of Ukraine", and the By-law on the Green Data Book of Ukraine.

4. International legal acts of which Ukraine is a Party. According to the Constitution of Ukraine, these acts, if subsequently adopted by the Verkhovna Rada (Parliament of Ukraine), become part of the system of national legislation.

5. The legal system of Ukraine includes not only the above-mentioned acts (mainly Laws of Ukraine), but also numerous Decrees of the President of Ukraine, Resolutions of the Cabinet of Ministers of Ukraine, and regulations and by-laws issued by specially authorized executive bodies.

Some aspects of implementation of the Convention in the context of main tools, constituents, and measures are briefly considered below.

3.1. An Overview of Implementation of the Convention on Biological Diversity in Ukraine

3.1.1. Financial and Economic Aspects

Scientists of the Council for Studies of Productive Forces of the National Academy of Sciences of Ukraine have conducted the evaluation of consumer values of natural resources. The results show that mineral and land resources play a significant role in the overall economic development (Fig. 3.1., Table 3.1). However, such assessment reflects only the static economic value constituent and does not take into consideration the importance of other aspects for protection of the environment and natural ecosystems and their dynamic reproduction.

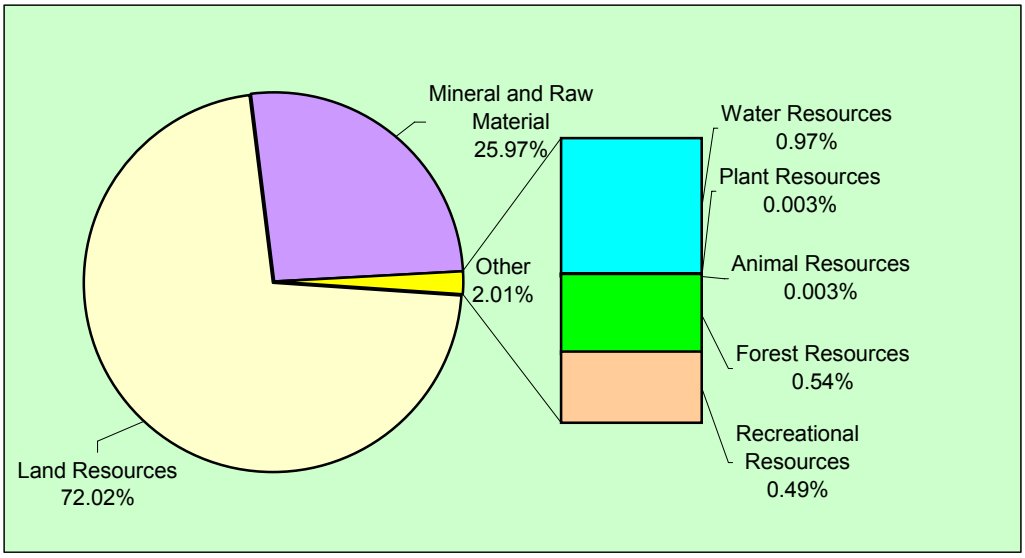


Fig. 3.1. Assessment of shares of natural resources of Ukraine

Table 3.1. Value of Natural Resources of Ukraine

Resources	Value, billion US dollars
Land Resources	3602.5
Mineral and Raw Material	1299.3
Water Resources	48.62
Flora (Plant Resources)	0.13
Fauna (Animal Resources)	0.15
Forest Resources	27.24
Recreational Resources	24.36
Total	5002.3

Natural resources (first of all minerals, raw material, and land resources) are the basis for the national economic progress. The intensive use of natural resources in Ukraine predetermined the infrastructure of specific threats to biodiversity, which gradually formed in Ukraine. Formation of the structure of economy based on development of raw materials sectors, gradual depletion of mineral resources, and extensive development of agriculture are the main factors that influenced the process of formation of this infrastructure.

Changes in the structure of the land fund of Ukraine are crucial for preservation of natural biogeocoenoses and biodiversity. At present agricultural lands dominate in the land fund structure as a result of extensive development of agriculture (Fig. 3.2.). Almost 80% of agricultural areas are arable lands. The land fund structure in the countries of the European Union considerably differs from the Ukrainian pattern. A share of agricultural and arable lands in EU is lower, and the share of forests is higher. About 15% of the EU territory are protected areas, and the share of these areas is rising.

The determined natural-resource indexes of sustainable development of Ukraine reflect the necessity of rearrangement in the shares of agricultural lands and lands under natural vegetation (Table 3.2).

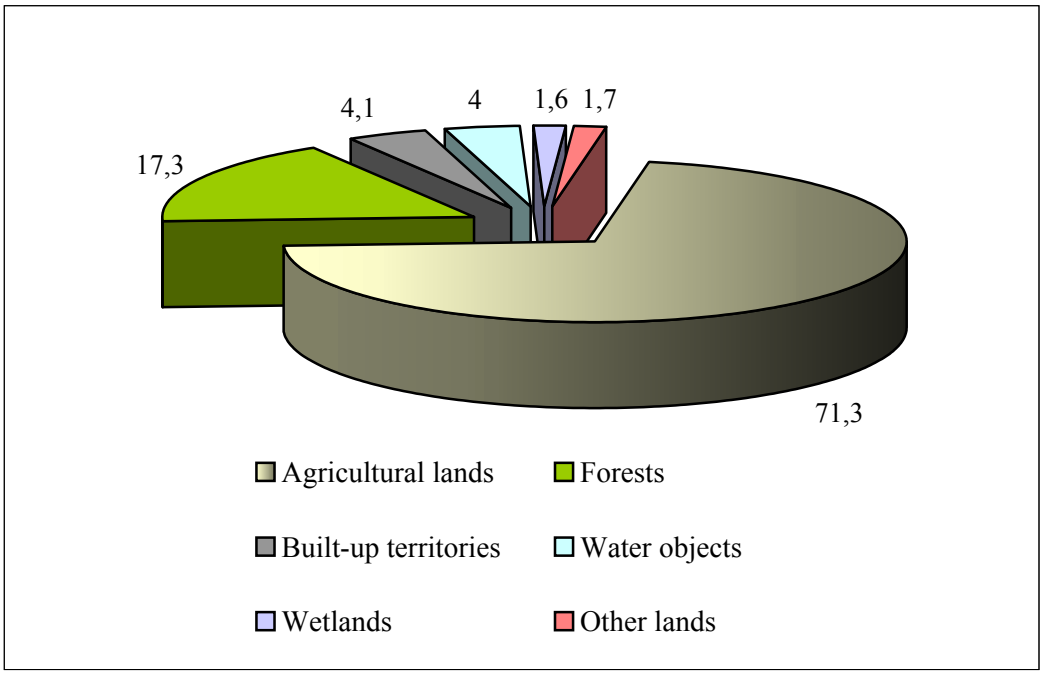


Fig. 3.2. Structure of the Land Fund of Ukraine (data of 1 January 2003).

Table 3.2. Natural resource indicators of sustainable development of Ukraine (provisional assessment)

Indicator	Value		Realization approach
	Real	Expertise	
Changes in the natural vegetation structure, million ha			
Natural vegetation	18.5	26.5	Reforestation, afforestation and meadow restoration on arable, degraded and low-productive lands
Protected areas	2.7	6.5	Development of the ecological network, biodiversity conservation
Arable lands	32.5	24.3	Re-naturalization (restoration) of natural vegetation, essential ecological, economic and social benefits
Forests	9.4	11.5	Re-naturalization of forests, increasing their productivity and social functions
Meadows	7.8	13.5	Re-naturalization of meadows, minimization of soil erosion, and essential economic effect

Wetlands	0.	1.5	Re-naturalization of wetlands, improvement of their hydrological regime, minimization of soil drought losses

A transition from plan-oriented to market economy has affected all aspects of social life in Ukraine, which was reflected first in the shift of priorities. Economic transformation and instability have led to impoverishment of the social sector and have provoked the uncontrolled use of natural resources. Thus, there is an urgent need in developing legal approaches to solving the problems of biodiversity conservation. It is obvious that such legal approaches should take into consideration principles and peculiarities of market relations. The analysis of correspondence of national environmental legislation to the present-day market conditions have shown some economic and legal weaknesses that should be dealt with:

- mechanisms of financing of biodiversity conservation activities;
- economic mechanisms and incentives for regulation of the use of bioresources
- tax benefits for economic activities aimed at, or resulted in, conservation and sustainable use of biodiversity
- regulation of ownership modes and relationships influencing the conservational status of biodiversity
- a system of compensations for restraints and limitations in the use of natural resources
- legal encouragement of the economic activities aimed at sustainable use of bioresources (recreation, green tourism, traditional nature management practices, etc.)
- legal aspects of functioning of the Nature Conservation Fund under market conditions

It is expedient to assume the mechanism of economic assessment of values of natural objects and their characteristics for Ukraine's population and the world community as a basis for a system of protection, rehabilitation, and sustainable use of the Nature Conservation Fund. Economic values of natural objects and their attributes are determined by economic assessments as the main tool for making decision on their reservation. Assessments of the value of natural objects and their constituents should be conducted for resources of ecological, economic, and social importance. Hence the cost of establishing a natural protected area or object, or any activity restriction, should be coherent with improvement of human health, environmental quality of industrial and agricultural products, and costs of ecological losses prevented due to the Nature Conservation Fund and biodiversity conservation. It is necessary to conduct economic assessments of natural protected complexes, to grant some facility to land users and landowners in case of creation of natural protected areas on their lands, to determine efficient mechanisms of diversified financing for natural protected areas and objects. It is also important to introduce the procedure of environmental insurance and audit, in particular for compensation of any damage inflicted at the territories and objects of the Nature Conservation Fund owing to natural disasters or industrial emergencies. At the same time, it is necessary to ensure financing of relevant measures in Ukraine with financial support of various international funds and organizations.

Determination of the balance cost and social significance of natural resources based on their economic assessments is the main problem when protected areas and objects of the Nature Conservation Fund are created. Economic assessments of social significance values are based on costs of ecologically safe water, soil, biodiversity,

quantitative and qualitative value of sanitary, recreational, educational, scientific, cultural, ethnic, historical, and informational potential; stabilizing environmental properties of landscapes, the value of natural rarities at the world market, etc. Willingness of vacationists and recreants to pay for using recreational resources is of great importance for multifunctional institutions of the Nature Conservation Fund. To evaluate such willingness, social surveys are conducted.

3.1.2. The Nature Conservation Fund and Biodiversity Management

Ukraine is a densely populated country, and under such circumstances biodiversity protection and conservation activities are often in contradiction (or even in conflict) with a socioeconomic situation existing in a specific region. Management of nature conservation areas and objects is traditionally based on the "top-to-bottom" principle. It is realized through the Nature Conservation Fund administration and local state authorities. Such type of management is inflexible. Local state authorities slowly react to socioeconomic problems, or quite often do not notice them at all. Consequently, administrations could not adequately respond to cultural, social and economic needs of local communities and all strata of society. Development of management plans based on participation of all stakeholders is a way of predicting and preventing conflicts of interests for the purpose of conservation of nature, historical and cultural values of territories or objects for the sake of both the local population and whole society.

There is a need in developing a national program on management of valuable natural areas. This program should be based on legally outlined permissible form of resource use and should be aimed at conservation (in some cases – on restoration) of natural biological and landscape diversity and historical and cultural heritage.

Laws of Ukraine "On the Nature Conservation Fund", "On local government" and the Land Code of Ukraine stipulate a list of documents, which are necessary for declaring valuable areas as Nature Conservation Fund objects.

Formal approval of land users, landowners, corresponding executive bodies, local authorities for land reservation is of great importance. However, under the present economic situation many land users, local government bodies, and local administrations usually disagree with reservation of areas. Such position often makes the initiation of new objects of the Nature Conservation Fund almost impossible.

Therefore, there is a need to make some additions and amendments to the articles 44, 46, 51, 52 in the Law of Ukraine "On the Nature Conservation Fund" that should foresee the following:

- Providing more tax and financial benefits for the land users and landowners having nature conservation objects on their territory;
- Possibility to initiate the process of reserving valuable territories on the base of corresponding conclusions or recommendations of the National Academy of Sciences of Ukraine and the Ministry of Environment and Natural Resources, apart from formal application and scientific justification;
- Possibility to buy-out from landowners valuable territories to establish new protected objects of the nature conservation fund at the expense of the state budget, ecological funds, or grants or sponsors.

It is also necessary to develop a set of documents regarding state management of territories valuable for biodiversity conservation, including areas of the Nature Conservation Fund, wetlands etc. These documents should be developed under active

participation of all stakeholders and will serve for prognosis and conflict of interests prevention as for the purpose of conservation of nature, historical and cultural values of territories as for the sake of local population and society in whole.

3.1.3. Environmental Education and Training of Specialists for Implementing Actions for Conservation and Sustainable Use of Biodiversity and Its Components

The problem of training and education of specialists in the field of biodiversity conservation is mainly solved. Scientific and research institutions of the National Academy of Sciences of Ukraine, the Ukrainian Academy of Agricultural Sciences, and higher education institutions pay attention to environmental education and training of specialists in this field. However, the number of specialists is still insufficient for a comprehensive and successful implementation of the national policy in biodiversity conservation.

In the recent years, the Government of Ukraine was paying more attention to reinforcement of nature conservation activities with skilled personnel. However, the lack of professional training for bachelors, specialists, masters, post-graduate students, and persons working for their doctoral degree is still the main problem. Taking into account that education and training of such specialist requires a correspondent basic educational level, there is a need for reorganizing the educational system (both secondary and higher education) with regard to environmental protection issues, including biodiversity conservation.

The integral national policy in the fields of protection, sustainable use and restoration of natural resources is still under development. Therefore, upgrading of environmental training of managers and specialists of the Ministry of Environment and Natural Resources and various executive bodies governing and controlling conservation and use of biodiversity is still a topical issue. By now, some progress has been achieved in this field. Thus, the Ministry of Environment and Natural Resources of Ukraine has developed special a intersectoral program aimed at training of specialists in nature conservation activities. The program is oriented to formation of personal responsibility for nature and is providing the environmental sector with highly qualified specialists and managers. Therefore, the program anticipates the implementation of an appropriate policy of personnel selection. Training of highly qualified specialist is one of the basic directions in developing nature conservation activities.

To achieve this goal, it is necessary to develop and introduce a new specialty "Nature conservation activity". It will become a basis for realization of Resolution of the Verkhovna Rada of Ukraine "On the memorandum of the Cabinet of Ministers of Ukraine about pursuing the state policy regarding implementation of Laws of Ukraine 'On the Nature Conservation Fund' and 'On Protection of Cultural Heritage' " No. 140-IV of 12 September 2002 as for improvement of personnel selection for institutions of the Nature Conservation Fund of Ukraine. Also the introduction of the new specialty will meet the requirements of the long-term program on training of highly qualified specialists in conservational activities, which was developed in pursuance of Resolution of the Cabinet of Ministers of Ukraine "On improvement of state administration and

management of nature conservation in Ukraine" No. 1259 of 12 November 1997, approved by the joint Order of the Ministry of Environment of Ukraine, Ministry of Education of Ukraine, National Academy of Sciences of Ukraine, and Ukrainian Academy of Agricultural Sciences, No. 111/149/122/66.

The proposed cycle of new disciplines has an essential shortcoming; namely, such courses as "Human ecology", "Organization of management in environmental activities", "Environmental security" put much emphasis to the problem of "protection of humans against environment" (i.e., anthropocentric approach), whereas success of the world ecological sciences is in protection of nature against the adverse human impact and formation of a new ideology. According to this ideology, all animal and plant species on the Earth have equal rights on being.

In view of the above, the Ministry of Education and Science of Ukraine regards training of skilled specialists as its main task. These specialists should be able to solve complex problems of sustainable use of natural resources and support of the ecological balance. Therefore, scientific researches should be targeted on investigation of ecosystem characteristics, structure, and functioning. In accordance with the Law of Ukraine "On higher education"" it is necessary to introduce such specialties as "Conservation and sustainable use of biodiversity" and "Nature reserve activity" to the courses "Ecology", "Biology", "Geography" and "Forestry and gardening". This will guarantee to some extent the environmental security of the Ukrainian nation.

Development of a special section devoted to environmental education and its inclusion in the National Program on Biodiversity Conservation is the key element of the governmental policy in training specialists for implementing actions and measures on conservation and sustainable use of biodiversity and its components. This section will envisage a multi-level system of continuous education and training of environmental specialists.

Preparation and introduction of such section (chapter) should be oriented on forming a strategy for implementing national policy on biodiversity conservation. This strategy should be implemented through various educational levels using a unified methodology both for educational planning at secondary and higher school and for professional development and continuous training of specialists working in administrations and various governmental bodies.

3.1.4. Scientific and Technical Cooperation. Organizational Problems of Scientific Research

Ukraine has achieved a substantial progress in biodiversity research, development of methodological approaches to biodiversity conservation and development of ecological and environmental databases. This expertise and scientific potential could be used for further development of scientific and technological international cooperation, including methodological development.

The program of scientific researches developed by the Ministry of Environment and Natural Resources of Ukraine includes theoretical studies, quantitative and qualitative assessment of biodiversity entities, and development of methods for its sustainable use and conservation. The assets and facilities of international environmental funds and agencies are involved for stimulating researches in the field of biodiversity conservation.

Ukrainian scientific institutions traditionally have been involved in solving environmental problems. Since the 1970s, Ukrainian scientists conducted researches in

this field. Two editions of the "Red Data Book of Ukraine" (1980, 1996) were published; scientific principles and methodology have been developed and the "Green Data Book of Ukraine" (1987) has been published. A perspective network of protected areas has been elaborated (1987) and fundamental geobotanical and floristic studies have been conducted. A special section of the Scientific and Technical Council is functioning at the Ministry of Environment and Natural Resources of Ukraine. This section coordinates scientific research in the field of conservation and use of national biodiversity, identifies priorities, promotes involvement of highly qualified scientists to the development of programs on conservation, restoration and sustainable use of biodiversity.

In general, the level of environmentally oriented methodological researches in Ukraine corresponds to the international level. Nevertheless, scientific researches in the regions do not cover all environmental aspects, and some problems have not been properly elaborated yet.

For example, there was almost no activity in Ukraine for developing and enhancing the national capacity in taxonomy, as outlined in the Global Taxonomy Initiative.

It is necessary to develop, within the National Program on Biodiversity Conservation, a special cadastral section covering the following issues:

- Financing of inventories for priority species, development and approval of lists of such species to be included into the cadastre;
- Development of short-, middle- and long-term objectives for investigation and support of the cadastres on species (or groups of species) of animals, plants, and other organisms, and plant communities and resources.
- Establishment of a unified center with advanced equipment and highly qualified personnel with the purpose of accumulation, processing, analysis, and generalization of cadastral and monitoring information relative to the flora and fauna;
- Uploading the cadastral databases to the Internet and the public access to the biodiversity sites;
- Developing a unified information exchange protocol for sharing data between the Cadastre and Monitoring Centers, regional centers of data collection and entry, including the centers running regional cadastres of natural resources and cadastres of Nature Conservation Fund objects.

It is advisable to create a National Scientific Coordination Board to raise the level of scientific research in the field of inventory, conservation, and sustainable use of biodiversity within protected areas of the Nature Conservation Fund. It first of all concerns researches on the *Chronicles of Nature* Program.

3.1.5. Public Awareness, Environmental Education, and Information Sharing

Ukraine takes appropriate measures to increase the level of public education and awareness in the field of biodiversity by improving teaching of natural sciences at secondary and high schools. Much attention is paid to raising public awareness via mass media. Periodicals, radio, and TV widely cover various aspects of conservation and positive attitude to plants, animals, and ecosystems. It is worth mentioning that a considerable contribution to biodiversity conservation was made by scientists from Uzhgorod, Dnipropetrovsk, Ivano-Frankivsk, Donetsk, and Kyiv. They used TV programs to acquaint people with the state of environment, specifically grasslands, forests, water objects, air, and rare species.

At the Children's Academy of Sciences of Ukraine, school students have opportunities to conduct their own scientific research on environmental problems. Environmental societies and clubs at schools were created in some regions of Ukraine. In local periodicals, there are special columns devoted to protection of plant and animal and nature conservation. The educational magazine *Ridna Priroda* (*Our Nature*) covers a broad scope of environmental issues, including nature conservation, environmental policy, environmental security, development of nature conservation activity and public participation in solving environmental problems. There are also other thematic periodicals, for example, the environmental bulletin *Zhyva Ukrayina* (*Living Ukraine*), discussing such problems as national and international environmental legislation, cooperation in biodiversity conservation, and the current situation related to environmental problems in various regions.

However, a unified comprehensive approach to public education and raising public awareness and participation in biodiversity conservation using international experience is not fully developed yet. Most programs on conservation and sustainable use of biodiversity are fragmentary and provide scanty environmental information, especially in the regions.

The system of popularization of knowledge on the legal basis of biodiversity conservation and use, modes and methods of conservation of natural ecosystems, public participation in living nature conservation for next generations needs further development and implementation.

It is worth to renew national experience and adopt experience of European countries in involvement of young people to voluntary work during vacations; for example, to work in reserves and recreation areas, to conduct such nature conservation activities as expeditions, investigations, "green patrols" etc. Such an approach, in combination with educational activities, will cultivate a new generation of environmentally aware and responsible citizens.

3.2. Incentive Measures

Development and application of incentive measures for the sustainable use of natural resources should be considered in context of global and Ukrainian processes. Preparation and signing of the Convention on Biological Diversity was under way concurrently with the adoption of the Agenda 21, the action plan approved at the Earth Summit (1992) in Rio de Janeiro.

The system of economic regulation of economic activity that affect on conservation and sustainable use of natural resources is the most effective incentive mechanism. Such regulation is realized through economic mechanism of nature use and nature protection activities operating with corresponding economic tools. Some of these tools (like taxes or penalties) constrain and some induce (like tax benefits, differentiation of prices for environment-unfriendly goods and services) entities of economical activity to observe environmental requirements aimed at resource-saving measures and sustainable land use.

Application of incentive measures has a specific intent. According to the Decision V/15 of the Conference of the Parties of CBD (Convention on Biological Diversity), the goal of incentive measures is to change institutional and individual behavior so as to achieve the unique goal of the Convention – conservation of biodiversity and sustainable use of its components.

The economic mechanism of environmental regulation in Ukraine is currently under formation. A number of environmental economic tools of the nature use and nature protection activities exist only as legislative regulations but still are not realized and not implemented into economic activity.

Last years in the system of nature conservation regulation, there is observed a tendency to devaluation of the cost of nature resources; in other words, their real value is underestimated. Such progressive underestimation leads to price ratio deformation at all level of economical activity, contradicts to the proclaimed ecological priorities and principles of sustainable development and becomes a barrier for resource saving, "ecologization" and reconstruction of national economy.

According to experts' opinion, to overcome negative ecological tendencies and to begin gradual implementation of a sustainable development model Ukraine should spend at least 2-3% of its GDP for environmental conservation and restoration. Such rate of financing is an average standard for the countries with a satisfactory environmental situation. As for Ukraine where some territories are zones of ecological risk, this percentage should be much higher. However, since Ukraine gained its independence, especially beginning from 1995, spending for nature protection (including biodiversity conservation) started to fall down. Current environmental spending of Ukraine is incomparable with expenditures of developed countries. Moreover, the comparison of debit and credit of the nature resource budget of Ukraine shows an essential misbalance and thus substantial reserves for environmental programs investment. Thereby overcoming of the systemic crisis and development of nature conservation activities depend on mobilization of these reserves. The situation when the ecological component in the lucrative section of the state budget is less than 5% is unsatisfactory. That is much lower if compared with developed countries or other countries of the former Soviet Union.

Lack of assessment of economic effectiveness is one of the main obstacles for a successful implementation of incentive measures for conservation and sustainable use of bioresources. It makes impossible any effective introduction of both positive incentives and anti-impetus. The absence of

economic evaluation does not allow to take stock of bioresources in accounting procedures and to include it to national wealth.

3.3. Conservation and Development of Traditional Knowledge, Innovations and Practices of Local Communities Embodying Traditional Lifestyles

During their long and often turbulent history, Ukrainians have accumulated comprehensive vision and knowledge on the environment and the living world. Historically, the nature use in Ukraine was strongly linked with natural landscape and local natural biological resources. Ukrainian people feel a very strong spiritual connection with the natural environment and all living beings. Local traditional attitudes, practices and traditional land use were developed on that basis. Areas of conventional farming coincide with the historically formed local and regional ethnosociolandscape system. In rural or weakly urbanized areas, local (mainly rural) communities together with national minority communities are subjects of conventional agricultural practice and carriers of traditional attitudes.

The main traditional forms of the nature use were agriculture, horticulture, cattle-breeding and poultry-keeping, hunting and fishing, beekeeping (apiculture), and partly hunting, timber logging and woodworking, hay-making, and gathering of brushwood, medicinal herbs, mushrooms, berries, nuts, wild honey, etc.

Some elements of the traditional nature use contributing to conservation and sustainable use of biodiversity are still widespread in under-populated and weakly urbanized regions with locale-specific industry in Polissya, Podillya (Podolia), Volyn (Volhynia), the Danube basin, the Carpathians, Crimea, Galychyna, and Pryazov'ya (Azov area). With respect to biodiversity conservation, traditional knowledge and experience are especially significant for areas bordering with protected objects or areas of national parks and biosphere reserves in various regions of Ukraine.

Implementation of traditional attainments and traditional nature management for conservation and sustainable use of biodiversity components is indirectly encouraged by a number of regulatory and legislative acts (environmental, cultural, and educational) and self-government experience. At the same time, such notions as "traditional and local environmental knowledge and practices" and "traditional nature management", are absent in the legislation in force, which complicates implementation of tasks and goals stipulated in Article 8(j) of the Convention on Biodiversity. Traditional forms of nature management are extensive and laborious, and in the course of time some practical skills of individual production (limited use of fertilizers, traditional farming calendar, pasture regulation) have been lost. Therefore, restoration of ancient nature management traditions under the present conditions should not turn into a paleoeconomic experiment. Communities, farmers, and economic organizations using traditional modes of nature management need a comprehensive support from the Government, local authorities, and public opinion.

The land reform in Ukraine is accompanied with land privatization and land titling that creates prerequisites for revival of traditional forms of nature management. The process of parcellization contributes to conservation and enrichment of biodiversity. Renewal of traditional forms and modes of cattle breeding in the private sector also diversify the structure of nature management.

The following measures could be taken to support Ukrainian traditional knowledge and experience:

renewal of the traditional ameliorative system in Polissya;

regeneration of the traditional fertilization system, allowing to produce ecologically clean food with no harm for the flora, fauna and soils;

development of rural "green tourism", oriented on recreation in rural areas using traditional local products, which is both beneficial for the sustainable use of local bioresources and profitable for local communities;

involvement of local communities in development of recreation and resort resources of national parks, organization of tourism and recreation activities, ecotourism, environmental education and training;

restoration and support of traditions and culture of the *polonyna*-type farming in the Carpathian Mountains and the *yaila*-type farming in the Crimean Mountains, based on scientifically sound standards of using natural ecosystems;

renewal of the network of functioning water-mills on mountain rivers, and also traditions of rural bread-baking and cheese-making in the Carpathian Mountains;

revival of the traditional *polonyna*-type (mountain) apiculture, trout and salmon breeding in Carpathian rivers (to prevent spawning disturbance, this measure should be accompanied with a strict ban on road construction across mountain rivers and streams)

renewal of horse breeding and stud-farms, mowing practice in the southern and eastern parts of Ukraine that will contribute to the traditional nature use and management and biodiversity conservation in the steppe zone of Ukraine;

inclusion of territories of traditional nature use and management into the National Ecological Network of Ukraine.

There is a need in developing effective economic incentive mechanisms for traditional nature management with the aim of conservation and sustainable use of biodiversity components. Such mechanisms could include targeted support for small and medium-size business, optimization of the tax and credit system to attract investments, implementation of environmental management and marketing, introduction of new criteria for certification of products and services based on traditional management, cadastrial support and allocation of lands of traditional nature management.

For the purpose of development of institutions of local governing and motivation of local communities to biodiversity conservation, it is necessary to develop a portfolio of pilot projects on support and introduction of traditional nature management, and a prospective plan for its implementation. Such projects could be both independent and integral parts of projects aimed at biodiversity conservation, development of the National Ecological Network, raising the level of environmental awareness, and optimization of environmental education.

3.4. Evaluation of the Implementation of the Convention on Biological Diversity in Ukraine

In analysis and evaluation of any international Convention, implementation of two components should be considered: providing national legislation conformity with

Convention requirements (formal legal aspect), and relevant implementation of legal provisions (law enforcement aspect).

It could be stated that in general the requirements of the Convention on Biological Diversity are implemented by Ukrainian legislation. During the period of formation of the independent state and development of its legal basis, a number of laws, by-laws, and other regulations were adopted in Ukraine. These documents reflect provisions and requirements of the Convention. However, Ukraine does not have a special law on biodiversity conservation, and its adoption in the nearest future is not anticipated.

The legal system of Ukraine regulates biodiversity conservation by:

1. Legislation on the Nature Conservation Fund and other protected areas (biodiversity conservation *in-situ*)
2. Legislation on natural resources (this legislation is differentiated, i.e. protection and use of lands, waters, forests, mineral resources, flora and fauna are regulated by separate legal acts)
3. Legislation on protection and preservation of plant and animal species, microorganisms, natural plant communities (Red and Green Data Books, etc.)
4. Economic legislation that identifies practices and modes of use of natural resources and bioresorces under different economical activities (agriculture, transport, industry, municipal sector, and power engineering).

Availability and transfer of technologies is one of the most important requirements of the Convention on Biological Diversity. Those issues are regulated by relevant legislation on intellectual property.

The "protective" aspect of biodiversity conservation is the most completed in legislation of Ukraine: legislation on plant and animal species preservation (Red Data Book of Ukraine), issues of organization and functioning of territories and objects of the Nature Conservation Fund are practically completely covered. Legislation on the National Ecological Network (Econet) is under development. The old version of the Forest Code of Ukraine did not cover all priorities of biodiversity conservation, which stimulated development of a new updated version of this document.

Within the legal system of Ukraine, the economic legislation is weakly developed. General goals of biodiversity conservation are proclaimed but ecological factors and priorities are not included into economic measures and actions. Not only economic but also financial, budgetary, tax and other legislation fields are in need of considerable revising.

At present, the access to and transfer of technologies are regulated by general legislation on intellectual property and by national and international conventions. Ukraine has not adopted special legal acts on that issue. The need of such special regulation is not considered expedient now, and thus it requires additional considerations.

Provision of implementation of the Convention on Biodiversity requirements is another important aspect of Ukrainian commitments and responsibilities under the Convention. Here Ukraine shows some progress expanding protected territories and areas of water and providing preparatory measures for developing the National Ecological Network. Nevertheless, serious problems still exist in the Convention implementation.

Among the circumstances that complicate implementation of the Convention, the following ones should be named:

- insufficient political support,
- lack of understanding of obligations implied from international agreements,

- low technical, administrative and financial abilities,
- lack of appropriate coordination of activities of national bodies and institutions,
- Low understanding of executive discipline,
- insufficient monitoring and analysis of task fulfillment,
- lack of public support,
- inadequate financing,
- changes in the economic situation, and
- unforeseen expenditures during requirement fulfillment.

Further development of the institutional base as a driving force in environmental management is the key issue for removing or regulating such obstacles and complications. In other words, organization of commitments fulfillment should be assigned to a well-defined structure. Undoubtedly it should be an executive body. Clause 1 of Article 14 of the Law of Ukraine "On International Agreements of Ukraine" states "…Ministries and other central bodies of state executive power of Ukraine, Government of the Autonomous Republic of Crimea, other state authorities provide the fulfillment of obligations undertaken by Ukraine according to international agreements, control the realization of rights of Ukraine and the fulfillment of obligations by other Parties."

According to the Law of Ukraine "On Environmental Protection" of 25 June 1991 (Article 20, Clause "й") "… international cooperation in the field of environment protection; investigation, summarizing and dissemination of international environmental experience; fulfillment of obligation of Ukraine in accordance with international Agreements on environment protection… are in the competence of the Ministry of Environment and Natural Resources of Ukraine and its local agencies". It means that organization of fulfillment of obligations of Ukraine in regards to international agreements on environment protection is a function of the Ministry of Environment and Natural Resources of Ukraine. However, absence of a clear legal procedure of international agreement implementation is a reason of inconsistent and non-systemic activity of not only the above Ministry, but other Ministries and governmental agencies as well. To a considerable extent, such situation depends on the human factor, particularly on personal attitude of high-level officials, re-orientation of priorities due to political situation changes, and other factors. Besides, usually there is no clearly estimated timing for obligation fulfillment and that could be "legal" explanation of executive body inefficiency. Lack of development of mechanism for financing of environmental activities could be added to the reasons mentioned above.

The situation is further complicated with the need for sectoral integration. There is also a need to involve different sectors of economy that are far from nature conservation activity, but influence, or could potentially influence, biodiversity conservation, to meet the requirements of the Convention on Biological Diversity.

3.5. Biodiversity Conservation in Ukraine: Actions Implemented after the First National Report on Conservation of Biological Diversity, and Further Progress

The present-day fundamentals of Ukrainian policy in the field of conservation of biological diversity are mostly concentrated in the Resolution of the Verkhovna Rada of Ukraine "On the main directions of state policy of Ukraine in the field of nature

conservation, use of natural resources, and environmental safety" No. 188/98-BP of 5 March 1998.

According to this document, eventual worsening of conditions or threat of irreversible damage to biological or landscape diversity, in particular to the forest, coastal and marine ecosystems, mountain areas, grasslands, pastures, lakes, rivers, and soils, are the factors that should be considered in the process of formation of national policy priorities in corresponding activities.

Considering the above, conservation of biological diversity and creation of national parks are considered the main priorities of nature conservation and rational use of natural resources.

The document emphasizes that intensive use of natural resources, neglect of the ecological in agroindustrial complex development, regulation of river runoff, drainage of wetlands, spontaneous development of collective gardening and other unsanctioned actions causing irremediable damage to biological diversity.

The resolution stipulates various measures (including legal ones) that should be realized for preventing or reducing the processes of degradation of natural ecosystem.

According to the Constitution of Ukraine (Article 92), social relations concerning biological and other natural diversity conservation nowadays are regulated by the legal system that includes the Laws of Ukraine "On the Animal Kingdom" of 13 December 2001, "On the Plant Kingdom" of 09 April 1999, "On the Red Data Book of Ukraine" of 07 February 2002, "On hunting management and hunting" of 22 February 2000, and also Codes – the Land Code of 25 October 2001, the Water Code of 06 June 1995, the Forest Code of 21 January 1994, and the Mineral Resources Code of 27 July 1994.

The Code of Ukraine "On administrative misdeeds" of 07 December 1984, and the Criminal Code of Ukraine of 05 April 2001 identify (designate) the amenability and liability for trespassing and violation of legislation in this field. Pecuniary liability for the damage resulting from violations of environmental legislation is regulated by general provisions of civil legislation and by corresponding special regulations of environmental legislation that approve special tariffs (fees and penalties) and methods for calculation of the harm/damage inflicted.

Important issues regarding state regulation of nature protection in general and conservation of biological diversity in particular, and also competence of local administration and executive authority, are regulated by Laws of Ukraine "On local government in Ukraine" of 21 May 1997 and "On local state administrations" of 9 April 1999, and other legal acts assigning the competence of authorities institutions.

Laws of Ukraine that regulate urban development, design and planning activities are of fundamental importance for biodiversity conservation. Among them, worth mentioning are the Law of Ukraine "On principles of urban development" of 16 December 1992, "On planning and building up of territories" of 20 April 2000, "On the general scheme of Ukrainian territorial planning" of 07 February 2002, and others.

The President of Ukraine and the Cabinet of Ministers of Ukraine within their authority stipulated in the Constitution have adopted a set of legislative acts.

The Cabinet of Ministers of Ukraine adopted the "Concept for conservation of biological diversity in Ukraine" by Resolution No. 439 of 12 May 1997. This document is based on primary regulations of the Pan-European Strategy Biological and Landscape Diversity Strategy (1995); it outlines the objects of biodiversity conservation, the main objectives, facilities, and the ways of problem resolution.

It is important that all wild animals, plants, their communities and habitats were determined as objects of biodiversity conservation. This Concept, in turn, became a basis for drafting of the National Program on Biodiversity Conservation until the year 2015.

The Concept states that "…biodiversity is being ruined nowadays as a result of development and plowing-up of lands, land reclamation, construction of water reservoirs, transport system and infrastructure development, and carrying out other types of economic activity. The Donbas and the Dnipro River areas, coastal and riverside zones, the highlands, forest and steppe regions have become ecologically unsafe. Territories under natural vegetation continue to shrink away, which seriously threatens the genetic and coenotic resources.

The Concept states that its aim is to achieve effective ecological aspects in all social and economic sectors, to stimulate and raise public participation and awareness in nature conservation by promoting and disseminating environmental information.

The Convention "On Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters" was ratified by Ukraine in 1999 that will assist to public participation in environmental decision making.

It should be mentioned that in general the main unsolved problems or gaps in the existing system of biodiversity conservation are as follows:

- it is difficult to convince sectoral authorities, land users and people in the necessity of lands withdrawal with reservation purposes;
- as a result of high anthropogenic transformation of landscapes and low level of their inventory, it is impossible to create a representative network of natural protected areas of Ukraine;
- official methods of the land allocation procedure and design of natural protected areas are absent;
- financing of scientific researches on formation of a representative geographical network of natural reserves in Ukraine is insufficient;
- public awareness regarding the expediency of activities in creating national parks and reserves is inadequate, and public participation in these processes is low;
- low cooperation between scientists, government officials, and local authorities;
- development of natural reserves have not become a political priority of national ecological policy;
- slowdown and withholding of reservation processes;
- no clearly defined strategy of development of nature conservation is formulated yet;
- management of natural protected areas is oriented on archaic stereotypes; personnel selection policy and training of professionals in the fields of scientific ecology, nature protection and biodiversity conservation is inadequate.

The system of protection of natural protected areas of Ukraine is deficient and does not ensure biodiversity conservation needs. Besides, it does not meet the requirements of national legislation in force and international standards.

The main imperfections of this system are as follows:

- Subordination to different agencies and institutions;
- Low qualification of personnel (especially rangers) of the Nature Conservation Fund of Ukraine;
- Limited rights and low legal protection;
- Lack of incentives for rangers and other personnel of the Nature Conservation Fund of Ukraine

- Absence of the protection or ranger service at some objects of the Nature Conservation Fund of Ukraine

Because of that at the next stage of legal regulation development on biodiversity conservation the emphasis should be shifted from special environmental legislation to the legislation that regulates different types of economic activities. The environmentally oriented accent in economic legislation is still an unsolved problem of Ukrainian legislation.

Ukraine has achieved some progress in realization of the Pan-European Biological and Landscape Diversity Strategy, in particular:

- within the frame of development of the Pan-European Ecological Network, the national legislative base was developed for the national ecological network (Law of Ukraine "On the State Program of Development of the National Ecological Network of Ukraine" No. 1989-III of 21 September 2000). The institutional infrastructure was reinforced and the framework of national protected areas and ecological corridors was created.
- For the purposes of cooperation reinforcement and for integration of priorities of biological and landscape diversity to the strategy of sectoral development (agriculture, transportation industry, tourism etc.) Ukraine undertakes measures on strengthening of integration tendencies under elaboration of programs of socioeconomic development of several regions. Such cooperation is the most complicated as far as economic priorities at the current stage of socioeconomic development of our state are decisive. That is why selection of approaches to achieve the Strategy goals on the mutually beneficial basis will be among the most important activities at the national level, and international experience will be widely used for these purposes.

An adequacy analysis of the system for regulation and rational use of the most important bioresources *in-situ* and *ex-situ* has shown that in spite of the developed legal system and availability of corresponding regulatory and legal acts on nature conservation and preservation of natural resources (including biodiversity and bioresources), the realization of nature protection measures, protection and preservation of biodiversity are dampened with lacking funds and insufficient financing of much needed scientific researches and nature conservation activities.

For achieving sustainable management and rational use of bioresources at the nearest time, it is necessary to undertake measures to protect populations of some species and ecosystems, which will secure *in-situ* conservation of genetic resources. For that at the state and international level, it is necessary to intensify the researches of biodiversity and systematical observation (monitoring) of its conditions.

It is expedient to develop as soon as possible effective measures and to widen international collaboration in the field of ecosystem protection, preservation of genetic and biological resources *in-situ* by means of development new and extension of existing protected objects (including organization of transboundary reserves and national parks) and also by means of creation of national and regional centers for *ex-situ* conservation of genetic resources.

Harmonization of national legislation on biodiversity conservation with the legislative system of the European Union will become an important factor of further development of national environmental legislation. Problems of ecological safety of biotechnologies, access to genetic resources, the level of protection and conservation of biodiversity and bioresources under market economy and private ownership development conditions should be efficiently regulated with newly developing environmental legislation. The existing legislation (with the exception of Laws of Ukraine "On the

Nature Conservation Fund" and "On the State program of Development of the National Ecological Network of Ukraine for the period 2000-2015") weakly reconciled with the existing system of conservation and sustainable use of biodiversity. And *vice versa*, development of the Nature Conservation Fund is oriented on implementation of the Convention in rather general terms, so far as in both cases only conservation of the biota is considered.

There are no references to biological diversity in the Water, Land and Forest Codes of Ukraine, nor separate articles that stipulate biodiversity conservation.

Besides laws, conservation and sustainable use of biodiversity is regulated by numerous Presidential Decrees, Resolutions of the Cabinet of Ministers and Orders of the Ministry of Environment and Natural Resources of Ukraine.

One could assert that the system of environmental legislation developed for the last 10 years is satisfactory. The main aims of this system are:

- *Integration into international environmental legislation,*
- *development if the national strategy for conducting socioeconomic reforms,*
- *legislative support of the sustainable use of Ukrainian biodiversity and ecosystems,*
- *regulation of society-nature relations,*
- *development of nature conservation activities and expansion of protected areas,*
- *ensuring of environmental security,*
- *prevention and mitigation of negative impacts on the environment,*
- *development of scientific researches, training of environmental specialist, providing of environmental education and public participation in biodiversity conservation*

At the nearest time all environmental legislative acts in regards to the status and modes of nature use should be harmonized with the Convention on Biological Diversity, especially those modes that involve undisturbed or weakly altered natural complexes.

Special attention should be paid to those violating the Laws of Ukraine "On the Animal Kingdom", "On the Plant Kingdom" and "On the Red Data Book of Ukraine". It is necessary to elaborate mechanisms of ecologically sound and sustainable development for zones adjacent to protected areas, particularly those located in buffer zones of the Nature Conservation Fund.

Preparation of the National Program for Biodiversity Conservation (for the period of 2004-2020) and its adoption by the Verkhovna Rada (Parliament) of Ukraine should become the next important step in developing the system of environmental regulation in Ukraine.

AFTERWORD

Probably at some moment in our life we may loose the ability to percept the living world around us as a wonder, with the beautiful perfection of its shapes, colors, sounds, its miraculous complexity, its harmony of fondness and power, grace and instincts. Loosing these fresh feelings, we also loose something greater: after this lost we could cold-heartedly observe devastation and destruction of the last remaining natural floodplains and estuaries, flooding the canyons, felling the forests. And at the same time many fundamental functions of the biota are forgotten, those functions, which our society could

never compensate. However, such losses could bring the humankind to the edge of a catastrophe.

Earth's biological resources are vitally important for economic and social development of the humankind. That is why thought is reaffirmed about the everlasting importance of living nature for the present and future generations, and biodiversity conservation activities on conservation of communities of living organisms of all levels of organization with their evolutionary interrelations among them and the environment - is the general concern of the humankind. At the same time, the threat to the very existence of species and ecosystems has never been as grave as it is now. According to experts' evidence, the processes of species extinctions caused by human activities are proceeding at catastrophic rates.

Wishing to change the situation for the better, international community has adopted many documents that determine commitments for the sustainable use of bioresources and basic principles for conservation of the sphere of life on the Earth. The Convention on Biological Diversity (CBD) is the most important international agreement in that respect.

At the time of its adoption, the attention has been drawn not only to biodiversity conservation but also to conservation and sustainable use of bioresources in their integrity. In addition, CBD should promote securing the sovereign rights of countries to use the resources within their territories and, at the same time, to encourage biodiversity conservation in mutual interests of the humankind while bearing in mind the importance of concerted international activities. Because of that the Convention became an important step toward formation of new holistic approaches to conservation of the natural environment based upon the concept of conservation and sustainable use of biodiversity.

The importance of activities in conservation and sustainable use of biodiversity and implementation of the ecosystem approach in nature protection has been once again proclaimed and confirmed at the Earth Summit on Sustainable Development held in Johannesburg (26 August - 4 September 2002). This direction has been included into the five priority objectives of the humankind, together with issues of conservation and sustainable use of water resources and agrisphere, energy, and health protection.

Biodiversity conservation is viewed in Ukraine as natural background for sustainable development of the country in general and of specific regions in particular, because it maintains functioning of ecosystems, supports the biospheric balance, and provides the resources for development of many sectors of economy. The Cabinet of Ministries of Ukraine has adopted the relevant Decree "On the Concept of Biodiversity Conservation of Ukraine" (No. 439 of 12 May 1997). Conservation of biodiversity is among the priorities of Ukraine's national policy in the domain of nature conservation, use of natural resources, and ecological safety, according to the Decree of the Parliament of Ukraine of 05 March 1998. These political decisions will be undoubtedly implemented, though it takes long time.

Ukraine ratified the Convention on Biological Diversity on 29 November 1994. This action allowed raising funds of many international and foreign organizations for nature conservation activities in Ukraine. It is worth noting that 10 million US dollars of international aid has been drawn directly for conservation of biodiversity and for solving

related issues. The Global Environment Facility made the most important contribution, primarily through the International Bank of Reconstruction and Development (IBRD) as an implementing agency of GEF. There were projects aimed at conservation of living nature of the Carpathians and the Danube, coastal zones in the Azov-Black Sea ecocorridor, and some others.

The second stage of Capacity Building for Biodiversity (No GEF-PPG 028968) has become one of the projects in this series. This project, although limited in its scope, was immensely important for Ukraine. The project was financed by the GEF grant and jointly implemented by the Ministry of the Environment and Natural Resources of Ukraine and IBRD.

The goal of the project "Second stage of Capacity Building for Biodiversity" was to promote justification of capacity-building needs and priorities in conservation and sustainable use of biodiversity, to develop the nation-wide dialogue on Ukrainian commitments related to CBD. The following directions in capacity building for the national system of biodiversity conservation have been worked out:

1. Implementation of general activities aimed at conservation and sustainable use of biodiversity in natural habitats (*in-situ*) and outside natural habitats (*ex-situ*), including development and drafting of legal, regulatory and institutional foundations for biodiversity conservation, in particular for the protected areas and units of the nature – conservation fund and other protected and specifically managed areas.

2. Assessment methodology diminishing specific threads to biodiversity components.

3. Preliminary assessment of monitoring programs, including issues related to taxonomy.

4. Conservation and sustainable use of biodiversity in the agricultural sector.

5. Developing incentives aimed at introduction of tools for the sustainable use of biodiversity.

6. Preservation and encouraging of biodiversity-related knowledge, innovations and traditions of local communities.

7. Developing of a mechanism to promote implementation of the CBD requirements (Clearing House Mechanism).

The Ministry of the Environment and Natural Resources of Ukraine has consulted the experts –(project team members) for producing pragmatic, instrumental results that would allow to effectively solve contemporary problems of conservation and sustainable use of biodiversity. Because of that the proposals for preparation of topical legal and regulatory acts were among the most important results of the project. Clearing House Mechanism (CHM) has been established to promote implementation of CBD, to help in the consultative process with experts and public. Analytical reports have been produced based on the results of expert researches and assessments on identification of institutional needs and priorities in Ukraine in conservation and sustainable use of biodiversity. They are accompanied with drafts of relevant regulatory and legal documents. Drafts of 12 new

laws, more than 300 proposed amendments to current legislation, 7 proposals of new Decrees of the Cabinet of Ministers of Ukraine, and proposals of 9 amendments to the acting Decrees of the Cabinet of Ministers are also among the results of the project implementation. The web site http:\biodiv-ukr.iatp.org.ua has been launched in the framework of the project to inform experts and public on the activities in implementing CBD. The Internet version of the First National Report of Ukraine on Biodiversity Conservation (1997, in English and Ukrainian) has been renovated; the second printing of the report has been made because the publication was in great demand. The text of the Second National Report on implementation of the CBD in Ukraine has been prepared in English, according to the format defined by Decision Y/19 of the Conference of the Parties, and submitted to the CBD Secretariat. The Second National Report "Conservation of Biodiversity of Ukraine" and a series of information booklets have been published as outcomes of the project activities. Taking into consideration the importance of raising awareness, supporting scientific and expert activities in the field of biodiversity, the Ministry of the Environment and Natural Resources of Ukraine proposed to publish the results of researchers in the series of monographs. Results obtained during project implementation will promote activities in the conservation and sustainable use of biodiversity in Ukraine.

Many events happened since the time of publication of the First National Report on Biodiversity Conservation (1997): new protected areas and have been established (with the support of partners from the Netherlands, Denmark, and Great Britain), two National Programs have been adopted - State Program of Development of the National Ecological Network of Ukraine, and the State Program on Protection and Restoration of the Environment of the Sea of Azov and the Black Sea. Thus, Ukraine completed its integration in the sphere of international environmental law, and is continuing improving the legal and institutional aspects. Unfortunately, these activities could not prevent distressing and dangerous trends of destruction of the natural environment and loss of biodiversity. Greater efforts, more resources and money are required, but the most important outcome has been probably already achieved — our awareness and understanding of the situation and our responsibility for the living world.

Ukraine thoroughly evaluates its objectives, status, and role in biodiversity conservation and makes its first steps in that direction. We deserve living in the healthy country, where virgin woods breathe, where water is clear and air is sweet, where nightingales sing in groves.

Annex 1

LIST OF LEGISLATIVE AND OTHER REGULATORY AND LEGAL ACTS IN FORCE IN THE FIELD OF BIODIVERSITY CONSERVATION AND USE

No	TITLE OF THE DOCUMENT	DATE OF ADOPTION (day.month.year)
LAWS OF UKRAINE		
1	On the Protection of the Environment	26.06.91
2	On the Nature Conservation Fund of Ukraine	16.06.92
3	On the Animal Kingdom	03.03.93
4	On Plant Quarantine	30.06.93
5	On Ecological Expertise	09.02.95
6	On the Exclusive (Maritime) Economic Zone of Ukraine	16.05.95
7	On Plant Protection	14.10.98
8	On the Plant Kingdom	09.04.99
9	On the UN Convention on Maritime Law	03.06.99
10	On Making Alterations in the Law of Ukraine "On the Nature Conservation Fund of Ukraine"	14.12.99
11	On the Moratorium on Entire Felling at the Mountainsides in Fir-Beech Forests in the Carpathian Region	10.02.00
12	On Hunting and Game Management	22.02.00
13	On the State Program of Development of the National Ecological Network of Ukraine for the period of 2000 – 2015	21.09.00
14	On the Adoption of the State Program of the Protection and Rehabilitation of the Azov-Black Sea Environment	22.03.01
15	On the Animal Kingdom (the latest edition)	13.12.01
16	On Alterations in the Law of Ukraine "On Hunting and Game Management	07.02.02
17	On the Red Data Book of Ukraine	07.02.02
18	On Alterations in the Law of Ukraine "On Plant Quarantine"	03.04.03
CODES		
1	Land Code of Ukraine	25.10.01
2	Forest Code of Ukraine	21.01.94
3	Mineral Resources Code	27.07.94
4	Water Code of Ukraine	06.06.95
RESOLUTIONS OF THE PARLIAMENT		
1	On the Program of Perspective Development of Nature Conservation in Ukraine	22.09.94
2	On the National Program for Environmental Rehabilitation of the Dnipro River Basin and Improvement of the Quality of Drinking Water	27.02.97
3	On the Principal Directions of the State Policy of Ukraine in the Field of Protection of the Environment, Use of Natural Resources and Environmental Safety	05.03.98

DECREES OF THE PRESIDENT		
1	On Creation of Azov-Syvash National Nature Park	25.02.93
2	On Preservation and Further Development of the Nature Conservation Fund of Ukraine	08.09.93
3	On Biosphere Reserves of Ukraine	26.11.93
4	On Reservation of Valuable Natural Territories for their Subsequent Conservation	10.03.94
5	On Creation of Nature Reservates of National Importance	10.12.94
6	On Creation of Vyzhnytsky National Nature Park	30.08.95
7	On Creation of Podilsky Tovtry National Nature Park	27.06.96
8	On Creation of Yelanetsky Steppe Nature Reserve	17.07.96
9	On Creation of Horhany Nature Reserve	12.09.96
10	On Creation of the Svyati Hory (Holy Mountains) National Nature Park	13.02.97
11	On Extending the Territory of Carpathian Biosphere Reserve	11.04.97
12	On Reservation of Valuable Natural Territories for their Subsequent Conservation (list of territories for reservation)	24.04.98
13	On Creation of Kazantyp Nature Reserve	12.05.98
14	On Creation of Opuksky (Opuk) Nature Reserve	12.05.98
15	On Creation of Yavoriv National Nature Park	04.07.98
16	On the Territories and Objects of the Nature Conservation Fund of National Importance	09.12.98
17	On Creation of Sokolivski Beskydy National Nature Park	11.02.99
18	On creation of Desniansko-Starogytsky National Nature Park	23.02.99
19	On Creation of Rivne Nature Reserve	03.04.99
20	On creation of Uzhansky National Nature Park	27.09.99
21	On the Territories and Objects of the Nature Conservation Fund of National Importance	04.11.00
22	On Creation of Cheremsky Nature Reserve	19.12.01
23	On the Territories of the Nature Conservation Fund of National Importance	21.02.02
24	On Creation of Hutsulshchyna National Nature Park	14.05.02
DECREES OF THE CABINET OF MINISTERS		
1	On the Order of Issuing Permits for Special Use of Natural Resources and Specifying Quotas for the Use of Resources of National Importance.	10.08.92
2	On Compensation Rates for Withdrawal of Animal and Plant Species Listed in the Red Data Book of Ukraine and for damages caused	01.06.93
3	On the Procedure of Maintaining the State Cadastre of Animal Kingdom	15.11.94
4	On the Program of Perspective Development of Nature Conservation in Ukraine	22.09.94
5	On the Approval of the List of Activities Related to the Environmental Measures	17.09.96
6	On the Approval of the Provisional Procedures for Fish Industry and Fishery	28.09.96
7	On the Strategy of Conservation of Ukraine's Biodiversity	12.05.97

8	On the Approval of the Statute on the State System of Environmental Monitoring (including monitoring of terrestrial and maritime ecosystems)	30.03.98
9	On the Approval of the Concept of the Protection and Rehabilitation of the Azov and Black Seas' Environment	10.07.98
10	On the Approval of the State Program "Forests of Ukraine" for the Years 2002-2015	29. 04.02
11	On the Approval of the Statute of the Green Data Book of Ukraine	29.08.02

Annex 2

LAW OF UKRAINE

ON THE STATE PROGRAMME OF UKRAINE'S NATIONAL ECOLOGICAL NETWORK DEVELOPMENT FOR YEARS 2000-2015

(Vidomosti Verkhovnoyi Rady Ukrayiny (VVR), 2000, issue 47, page 405)

The Supreme Council (Parliament) of Ukraine RESOLVES hereby as follows:

1. The attached State Programme of Ukraine's National Ecological network Development for Years 2000-2015 shall be approved.

2. This Law shall become effective from the date of the publication thereof.

3. The Cabinet of Ministers of Ukraine shall:

- appoint people in charge of the implementation of actions related to the development of the national ecological network;

- earmark appropriate funds for the implementation of actions related to the development of the national ecological network for the forthcoming year during the development of the draft State Budget of Ukraine and the draft State Economic and Social Development Programme of Ukraine.

LEONID KUCHMA
President of Ukraine
City of Kyiv, 21 September 2000
#1989-III

Approved by
Law of Ukraine
#1989-III
of 21 September 2000

STATE PROGRAMME OF UKRAINE'S
NATIONAL ECOLOGICAL NETWORK DEVELOPMENT
FOR YEARS 2000-2015

Section I. GENERAL PROVISIONS

The State Programme of Ukraine's National Ecological Network Development for Years 2000-2015 (hereinafter referred to as the "Programme") has been developed in the context of requirements related to the further refinement, improvement and development of the environmental legislation of Ukraine, as well as in line with recommendations of the Pan-European Biological and Landscape Diversity Strategy (1995) in respect of the issue of the development of the Pan-European Ecological Network as a single spatial system of areas of European countries with the natural or partly altered condition of the landscape.

A great deal of importance is placed upon the improvement of the regulatory and legal framework in the field of the preservation, expansion, restoration and protection of the single system of areas with the natural condition of the landscape and other natural complexes and unique areas, the establishment of natural objects subject to special protection on their territory, thus contributing to the reduction, prevention and elimination of the negative impact of the business and other activities of the people on the environment, the preservation of natural resources and the gene pool of the animate nature.

The ecological network development provides for changes in the structure of the stock of lands of the country by attributing (on the basis of the justification of the environmental safety and the economic feasibility) some lands used for purposes of the economy to the categories subject to the special protection with the restoration of the diversity of natural landscapes inherent in them.

The wealth of natural landscapes is the common property of the Ukrainian people, its natural heritage and should serve to the current and future generations as declared in the Constitution of Ukraine (254k/96-VR).

1. Terms and Definitions

The following terms and definitions shall are used herein:

'biological (biotic) diversity' shall be understood as the totality of all species of plants, animals and micro-organisms, groups thereof, and ecosystems within the territory of Ukraine, its territorial and internal marine waters, exclusive (marine) economic zone and continental shelf. The biological diversity consists of the species, population, cenosis and genetic diversity. Human beings are an integral component of the biological diversity and cannot exist other than within it;

'buffer zone' shall be understood as an area with the natural or partly altered condition of the landscape, which surrounds the most valuable sections of the ecological network and protects them against the impact of negative external factors of the natural or anthropogenic origin;

'ecological network' shall be understood as an integral territorial system, which includes areas of natural landscapes subject to the special protection, and areas and objects of the natural reserve fund, resort, curative, recreational, water protection, field protection areas and objects of other types as specified by the legislation of Ukraine and is a part of the structural territorial elements (hereinafter referred to as the "elements") of the ecological network, namely natural regions, natural corridors and buffer zones;

'cadastre of areas and objects of the natural reserve fund' shall be understood as a system of recording and assessing the condition of areas and individual objects of the natural reserve fund, and their

territorial totalities in terms of quantity and quality, whose purpose is to provide executive agencies, local self-administration bodies, individuals and legal entities with adequate data on the legal status, title, regime, geographical location, quantitative and qualitative characteristics of these areas and objects, their environmental, scientific, educational, recreational and other value for the purposes of the protection, preservation and efficient management of the operation and development of the natural reserve fund;

'land conservation' shall be understood as the withdrawal of (agricultural or industrial) lands from the economic turnover for a certain period to take actions aimed at the restoration of the fertility and environmentally acceptable condition of soils, as well as the restoration (renewal) of the lost environmental balance in a specific region;

'ecological network status monitoring' shall be understood as a system of the observation of changes in components of the environment within the ecological network in order to timely identify the negative trends in their condition, assess possible consequences of such changes, predict and prevent negative processes, eliminate their aftermath;

'population' shall be understood as a totality of individual organisms of the same species with general conditions required to maintain the number of such organisms at a certain level during a long period;

'natural region' shall be understood as a natural and territorial formation of considerable area, whose integrity shall be determined by area-specific phyto-landscape, physical and geographical, administrative and other indices characterised by typical and unique natural complexes, diverse flora and fauna, and which plays a regional role of stabilising the environment;

'natural corridor' shall be understood as an area of land or water surface either being in or brought to the natural condition, which ensures that the environment meets the conditions of the continuity, systematic unity and carries out the bio-communication functions at various levels of the spatial organisation of the ecological network;

'natural landscape' shall be understood as an integral natural and territorial complex with genetically homogenous and uniform natural conditions of localities, which have developed as a result of the interaction of components of the geological environment, relief, hydrogeological regime, soils and biocenoses;

'coastal marine natural landscapes' shall be understood as natural landscapes including land and sea (water) based natural complexes and objects;

'existence environment of plants and animals' shall be understood as a totality of environmental conditions (both abiotic and biotic), which an individual, a population or a species exists in and cannot exist without;

'cenosis (biocenosis)' shall be understood as an historical totality of plant and animal species inhabiting an area with more or less uniform existence conditions (biotope).

2. Current Condition of Areas and Objects Subject to the Special Protection

Areas and objects subject to the special protection (areas and objects of the natural reserve fund, resort and curative, recreational,

water and field protection, and other natural areas and objects) account for a relatively insignificant share of the territory of Ukraine. The current area and territorial structure of the lands of Ukraine, which are subject to the special protection, provide certain grounds for attributing them to a territorial system with certain features of an ecological network. The current condition of natural landscapes of Ukraine meets the criteria of the Pan-European Ecological Network only in part.

The national ecological network shall include the share of lands of the country, where natural landscapes have been preserved in an almost unchanged or partly changed condition.

The area of lands being components of Ukraine's National Ecological Network is specified in Annex 1.

In addition, the ecological network shall also include individual littoral sections of the Black Sea and Sea of Azov.

Natural landscapes can be observed at almost 40 per cent of the territory of Ukraine. They are preserved in the least changed condition at lands covered with forests, shrubs, marshes, and at open lands, whose area accounts for about 19.7 per cent of the total area of the country. Since only 44 per cent of forests perform protective and environmental functions, one may assume that landscapes occupying about 12.7 of the territory of the country are in the condition close to the natural one.

The best-protected are the natural complexes within territories of the natural reserve fund. As of 01 September 2000, the natural reserve fund of Ukraine includes biosphere and natural reserves, national natural parks, regional landscape parks, special reserves, natural monuments, reserve tracts, botanical gardens, dendrological parks, zoological parks, parks being monuments of the landscape architecture with the total area of around 2.4 million hectares, or 4 per cent of the territory of the country. Almost 0.5 million hectares of these lands have been granted for use to institutions of the natural reserve fund.

Currently, the flora of Ukraine consists of over 25 thousand plant species; the fauna consists of almost 45 thousand animal species. The negative anthropogenic factors of the influence upon the environment resulted in the extinction of a large number of biological species and endangered the existence of many existing species. This resulted in 541 plant species and 382 animal species being included in the Red Data Book of Ukraine and 127 rare and threatened typical plant communities being included in the Green Data Book of Ukraine. The numbers of almost all species of birds of prey, as well as waterfowl, gallinaceous, gruiform birds birds, mammals, fishes and insects are gradually reducing.

Adverse changes in the marine flora and fauna are caused by invasions of harmful alien species. Representatives of plant families Orchidaceae, Poaceae, Asteraceae, Liliaceae, Amaryllidaceae, Iridaceae and some other become rare and endangered. By the end of this century, 20 more species of mammals and a number of other species of other animals and plants can be entered in the Red Data Book of Ukraine. More than 20 per cent of populations of wild medicinal or technical plants are on the eve of the exhaustion as a result of the uncontrolled use.

In biocenoses of Ukraine, the trend of the rapid propagation of virus infections has been observed. A number of flora and fauna objects are affected with viruses.

According to the Programme of the Prospective Development of Reserves in Ukraine (177/94-VR) approved by Resolution of the Supreme

Council (Parliament) of Ukraine of 22 September 1994, the area of the natural reserve fund has been growing dynamically. However, its share in the total area of Ukraine, the diversity of types of natural landscapes and plant groups, the territorial structure of the nature protection territories do not fully comply with international standards, the strategy of planning the territory of the country. In addition, as a result of the prevalent development of raw material production sectors in Ukraine, which are the most hazardous sectors from the environmental point of view, and the excessive tillage of soils, the conditions of ensuring the territorial continuity of areas with natural landscapes deteriorated. This complicates and sometimes makes impossible the spatial processes of the biological exchange at the cenotic and genetic levels inherent in the live nature.

The favourable pre-requisites for the increase in the area of lands with natural landscapes, which emerged in the course of the reform of economic relations in the field of the land use, are ensured by:

- withdrawing agricultural lands (first of all, degraded arable lands) as a result of the non-profitability of their use for designated purposes;

- withdrawing land plots, which have lost their natural condition and endanger the preservation of the environment, from the industrial use (in the field of raw materials production, construction and in other sectors);

- giving preference to the restoration of natural landscapes as the most appropriate type of the use of lands withdrawn from the agricultural use;

- establishing water protection zones and coastal protection belts around waters;

- increasing the area of forests, woodland belts around agricultural lands, industrial and residential areas;

- the need for Ukraine to comply with its international commitments in the field of the environmental protection.

3. Objective and Tasks of the Programme

The principal objective of the Programme is to increase the area of lands of the country under the natural landscapes to the level sufficient for the preservation of their diversity close to their initial natural condition and the development of their territorially integrated system built to ensure the possibility to use the natural ways of the migration and propagation of species of plants and animals, which would ensure the preservation of natural ecosystems, species and populations of the flora and fauna. At that, the National Ecological Network should meet the requirements to the operation thereof within the Pan-European Ecological Network and perform the leading functions in respect of the preservation of the biological diversity. In addition, the Programme should contribute to the balanced and sustainable use of biological resources in the economy.

Major tasks of the Programme shall be as follows:

1) in the field of the development of the national ecological network:

- to determine the spatial structure of the ecological network in order to systematise and determine the ways of the integration of natural environments of the existence of populations of wild flora and fauna species in a territorially integral complex;

- to determine the area of individual ecological network elements in order to ensure favourable conditions of the existence, free propagation and migration of plant and animal species;

- to justify and refine the organisational, economic, scientific, practical and other actions in order to support the process of the development and protection of the ecological network;

- to determine areas for the development of components of the national ecological network, such as natural regions, natural corridors of national importance; to define their place in the structure of lands;

- to optimise the area, structure and status of elements of the ecological network, to increase their protection status;

- to reserve and then confer the appropriate status on reserve areas being rich in terms of the biodiversity, especially on the old nature groupings, river-bed, mountain, and gully forests, virgin lands, typical and unique ecosystems and landscapes, existence environments of rare and endangered species, geological formations and standard soil types, etc.;

- to agree upon the issues related to the transboundary integration of elements of ecological networks of neighbouring countries with elements of the national ecological network of Ukraine in order to develop the Pan-European Ecological Network;

- to inform the population about the role of the ecological network in maintaining the environmental balance in regions, to ensure the participation of local executive agencies and the population in the preservation of the landscape diversity;

2) in the field of the protection and restoration of land resources:

- to optimise areas of agricultural lands and to reduce the extent of the tillage of such lands;

- to improve the structure of agricultural lands and to enrich them with natural components;

- to introduce a soil-protective farming system with the contour-irrigation organisation of the territory;

- to restrict the destructive intensive use of environmentally vulnerable lands;

- to preserve the agricultural lands with very washed out and very deflated soils at slopes, whose gradient exceeds 5-7 degrees;

3) in the field of the protection and restoration of water resources:

- to ensure the ecological sanation of natural land and water areas, especially river sources, to improve the condition of flood ecosystems in basins of the Dnieper, Dnister, Southern and Western Boog, Siversky Donets, Danube, including the creation of protective belts along the coasts of water objects, especially at very steep areas, to take actions aimed at the preservation of wetlands, to enhance their water protective and water control ability, ensure their re-naturalisation and improve the protection of natural complexes of the water protection zones of water objects;

- to develop and take actions aimed at the preservation of coastal landscapes of the Sea of Azov and the Black Sea, to create a network of marine objects of the natural reserve fund;

4) in the field of the protection, use and restoration of resources of the flora and fauna:

- to create areas with forest and meadow type vegetation in agricultural landscapes;

- to restore (re-naturalise) the steppe, meadow, wetlands and other natural landscapes, where appropriate and feasible;

- to arrange for new areas to maintain the existence environments of certain plant and animal species entered in the Red Data Book of Ukraine and the natural plant groups entered in the Green Data Book of Ukraine, the European Red List of Plants and Animals Endangered throughout the World, as well as other plant and animal species included in lists of international conventions and agreements binding upon Ukraine;

- to optimise the agriculture, forestry, hunting and fishing taking into account the existence conditions of species of the local flora and fauna;

- to improve the condition of the protection, preservation and restoration of greenery plantations and forests being components of greenery zones of cities and other populated areas;

5) in the field of the biodiversity preservation:

- to maintain, strengthen and restore key ecosystems and existence environments of plant and animal species;

- to ensure the stable management of the positive potential of the biological diversity by way of the optimal utilisation of the social and economic opportunities at the national and regional levels;

- to take into account the objectives in the field of the preservation, and balanced and sustainable use of the biological diversity in all sectors using or influencing the same;

- to take targeted actions meeting the requirements of the preservation of various types (mountain, steppe, meadow, coastal, marine, river, flood, lake, wetland and forest) of ecosystems and based upon the legal and financial potential of the nature users and state authorities.

4. Conceptual Provisions of the National Ecological Network Development

The following shall constitute the legal basis for the development of the national ecological network: Laws of Ukraine "On Environmental Protection" (12264-12), "On Natural Reserve Fund of Ukraine" (2456-12), "On Fauna" (3041-12), "On Flora" (591-14), the Land Code of Ukraine (561-12), the Forest Code of Ukraine (3852-12) and the Water Code of Ukraine (213/95-VR). The natural areas of international importance shall be set up in accordance with international treaties of Ukraine, for instance 1971 Convention on Wetlands of International Importance especially as Waterfowl Habitat (995_031), 1972 Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention (995_089), 1979 Convention on the Conservation of European Wildlife and Natural Habitats (995_034) (1979), 1979 Convention on the Conservation of Migratory Species of Wild Animals (995_136), Convention on the Protection of the Black Sea Against Pollution (995_065) (1992), Convention on Biological Diversity (995_030) (1994), Pan-European Biological and Landscape Diversity Strategy (1995), Convention on the Protection and Use of Transboundary Watercourses and International Lakes (994_273) (1999).

The natural regions, natural corridors and buffer zones in their continuous integrity shall form a network, which unites natural landscape areas into a territorially integral system. Depending on functions, area and animal and plant species structure, elements of the international, national and local importance shall be identified within the national ecological network.

The natural regions shall be formed in territories, which contain objects of the natural reserve fund, whose percentage is considerably higher than the country average value, as well as other territories, which meet the conditions determined by the national environmental protection legislation or international regulatory and legal acts (conventions, agreements, treaties, etc.) and ensure the protection of the landscape and biological diversity, especially those, which include habitats of rare and endangered species of plants and animals.

The natural corridors shall have the form of natural landscape areas of a prolonged configuration being of various width, length, or shape, and interconnecting natural regions. They should ensure the appropriate conditions of the preservation of wildlife species.

The buffer zones shall be established to protect the natural regions and corridors against the detrimental impact of external factors, to create more favourable conditions within them for the development, self-restoration, and optimisation of management forms in order to preserve the existing natural values and to restore those extinct.

The following shall be the components of structural elements of the ecological network:

1) areas and objects of the natural reserve funds being the major natural elements of the ecological network, namely: natural and biosphere reserves, national natural parks, regional landscape parks, sanctuaries (landscape, forest, botanical, general zoological, ornithological, entomological, ichthyological, hydrological, general geological, palaeontological, and karst/speleological), natural monuments, as well as their protection zones; artificial objects (botanical gardens, dendrological parks, zoological parks, parks being monuments of the landscape architecture);

2) water objects (sections of a sea, lake, water reservoir, river), wetlands, water protection zones, coastal protection belts, allocation belts, coastal belts of waterways and sanitary protection zones, which make up the relevant basin systems;

3) forests of the first group;

4) forests of the second group;

5) resort and curative areas with their natural resources;

6) recreational areas for the organisation of the recreation of the population and tourism;

7) other natural areas (areas with steppe vegetation, meadows, pastures, rock placers, sands, saline lands, etc.);

8) land plots, where natural plant groupings entered in the Green Data Book of Ukraine grow;

9) land plots, where species of animals and plants entered in the Red Data Book of Ukraine stay or grow;

10) partly, the agricultural lands used extensively—pastures, meadows, hay harvesting areas, etc.;

11) radioactively polluted lands, which are not used and are subject to special protection as natural regions with specific status.

Section II. DEVELOPMENT OF THE NATIONAL ECOLOGICAL NETWORK

5. Increasing the Area of the National Ecological Network

In order to increase the area of the national ecological network, the Programme provides for the following actions:

1) setting up objects of the natural reserve fund in areas, which meet the conditions of ensuring the protection of natural complexes (Annex 2);

2) increasing the area of lands granted for use to institutions of the natural reserve fund from 0.5 to 2 million hectares;

3) preserving natural landscapes in areas being of historical and cultural value;

4) including actions aimed at setting up and arranging the water protection zones and coastal protection belts of water objects in programmes of the ecological sanation of basins of Siversky Donets, Southern Boog, Dnister, Danube and Western Boog, implementing a special regime of the use of lands in river source areas;

5) forming transboundary nature protection areas of international importance;

6) setting up protective forest plantations and field protection forest belts, arranging meadows (Annex 3);

7) preserving the degraded and polluted lands with subsequent partial reforestation thereof (Annex 4);

8) maintaining natural landscapes in lands used for the industrial, transportation, communication and defence purposes;

9) increasing the area of forests in an environmentally appropriate manner.

As a result of the implementation of the above actions, it is projected that the area of lands of the national ecological network will be as specified in Annex 5.

6. Restoration of the Natural Condition of Elements of the Ecological Network

In areas being components of the national ecological network, it shall be ensured that special actions be taken aimed at the prevention of the destruction of or damage to natural landscapes, natural plant groupings entered in the Green Book of Ukraine, the preservation of animal and plant species entered in the Red Data Book of Ukraine, the improvement of their existence environment, the creation of appropriate conditions for their propagation in their natural state and dissemination.

In order to ensure the performance of the environmental protection functions of the national ecological network, the Programme provides for the following actions:

1) the protection of the animal existence environment during their migration and wintering, and the creation of a system of the protection of animals;

2) the expansion of the network of water objects for the migration of fish;

3) the creation of conditions for the restoration of the diversity of species of plants and animals, and phyto-cenoses in natural zones;

4) the protection of wetlands of the international and national importance;

5) the implementation of actions aimed at preventing the detrimental impact on natural complexes of elements of the national ecological network;

6) the implementation of a system of taking the environmental protection actions in order to preserve natural complexes of elements of the national ecological network;

7) the preservation of populations of plant and animal species, special actions aimed at ensuring the migration of animals and plants at intersections of natural and transport corridors.

7. Development of the Integral Territorial Structure of the National Ecological Network

The national ecological network shall include elements of the national and local importance to be identified on the basis of scientific, legal, technical, organisational, financial and economic criteria.

The following shall be considered elements of the national ecological network of national importance:

- natural areas, where both existing natural reserve areas and those to be set up are concentrated. First of all, these are Carpathian Mountains, Crimean Mountains, Donets Ridge, Azov Highlands, Podillia Highlands, Polissia (marshy woodlands), sources of small rivers, certain estuary areas of large rivers, marine coastal area, the continental shelf, etc.;

- major communication elements of the national ecological network, namely, the latitudinal natural corridors ensuring the natural communications of zonal nature in Polissia (forest zone), Halychyna - Slobozhanshchyna (forest-steppe zone), Southern Ukraine (steppe zone), as well as meridional natural corridors limited in terms of their space with valleys of large rivers (Dnieper, Danube, Dnister, Western Boog, Southern Boog, Siversky Donets), which combine water and flood landscapes, i.e., the ways of the migration of numerous species of plants and animals.

A separate natural corridor of international importance consists of a chain of coastal and marine natural landscapes of the Sea of Azov and the Black Sea, which surrounds the territory of Ukraine in the South.

The list of major elements of the national ecological network of national importance is provided in Annex 6.

Elements of the national ecological network being of local importance shall be identified in specific regional programmes and regional schemes of the ecological network development.

8. Organisation of Common Transboundary Elements of the National Ecological Network and the Pan-European Ecological Network

The programme provides for the integration of the national ecological network with ecological networks of neighbouring countries being members of the Pan-European Ecological Network by means of setting up common transboundary elements of the ecological network within natural regions and natural corridors, agreeing upon the land use projects in border areas.

The common transboundary elements of the national ecological network will be set up in co-operation with the following countries:

- the Republic of Poland (Western Polissia Biosphere Reserve, Eastern Carpathian Biosphere Reserve, Roztochany Biosphere Reserve);

- the Republic of Belarus (Western Polissia Biosphere Reserve, Rivne Nature Reserve, Prypiat-Stokhid National Nature Park);

- the Russian Federation (Snov Nature Reserve, Luhansk Nature Reserve, Desna-Stara Guta National Nature Park, Meotida National Nature Park, Donets Ridge National Nature Park);

- Romania (Danube Biosphere Reserve, Vyzhnytsia National Nature Park);

- the Republic of Moldova (Lower Dnister National Nature Park);

- the Slovak Republic (Eastern Carpathian Biosphere Reserve).

The list of actions aimed at setting up the national ecological network of Ukraine and the scope of funds required for such actions are provided in Annexes 7 and 8.

Section III. PROGRAMME IMPLEMENTATION MECHANISM

9. Regulatory and Legal Framework

In order to ensure the implementation of the Programme, it is planned to adopt legal acts aimed at implementing the legal norms of the development of the national ecological network. To this end, the laws of Ukraine on the national ecological network of Ukraine, on the preservation of lands, on the economic incentives motivating the land owners and users to take actions aimed at the development and maintenance of the ecological network, on the coastal belt of the seas shall be adopted; appropriate changes shall be introduced in the Land Code of Ukraine, the Forest Code of Ukraine, the Water Code of Ukraine, laws of Ukraine "On Environmental Protection", "On Ensuring the Sanitary and Epidemiological Well-being of the Population".

It is planned to develop and approve other regulatory and legal acts aimed at improving the economic mechanism related to the protection and restoration of natural landscapes, and the preservation of their biological diversity.

In order to strengthen the liability for the violation of requirements of the legislation on the protection, use and restoration of the landscape diversity, it is planned to introduce changes in the Criminal Code of Ukraine and the Administrative Misdemeanour Code of Ukraine.

10. Funding

The implementation of the set of actions provided for hereby shall be financed from funds of the State Budget of Ukraine, the republican budget of the Autonomous Republic of Crimea, local budgets, environmental protection funds in budgets of all levels, as well as from other sources, for instance grants of the Global Ecological Foundation and other international environmental organisations. The Programme may be funded by enterprises of all ownership forms and other legal entities.

The major source of the coverage of expenses for the development of elements of the national ecological network being of national importance shall be the funds earmarked in the general and special funds of the State Budget of Ukraine for the actions aimed at the protection of the environment. The development of structural elements of the national ecological network being of local importance shall be funded from funds specified in appropriate sections of local budgets and local environmental protection funds.

The feasibility study of actions aimed at developing the elements of the national ecological network being of national importance with approximate estimate of the results thereof shall be submitted annually as part of the draft State Economic and Social Development Programme of Ukraine for the coming year by a specifically authorised central executive agency being in charge of the issues of the ecology and natural resources of Ukraine, which is the party contracting the Programme on behalf of the state.

11. Scientific Support

In order to provide the scientific support to the actions aimed at the development of the national ecological network, the Programme provides for the fundamental and applied research aimed at developing recommendations and methods of the preservation and restoration of the landscape diversity, including the evaluation of the current condition of natural landscapes, the justification of the most efficient actions, which will ensure the balanced and sustainable use of their natural resources, the inventory of natural complexes and components thereof, the organisation of keeping the cadastres of natural resources and the environmental monitoring within the national ecological network, the establishment of appropriate databases and geographical information systems.

12. Organisational Support

The organisational support to the implementation hereof shall be rendered by the specifically authorised central executive agency being in charge of the issues of the ecology and natural resources of Ukraine, together with concerned central and local executive authorities. This agency shall also control the implementation hereof.

The agency ensuring the organisation of the Programme implementation shall submit reports to the Cabinet of Ministers of Ukraine on an annual basis, as well as the necessary information on the progress of the implementation of Programme tasks.

On the basis of the provided information, the Cabinet of Ministers of Ukraine shall adjust the Programme tasks, their contents and scope of funding.

A deliberative body (Co-ordination Council) shall be set up to co-ordinate activities of the central and local executive agencies implementing the Programme. The membership of the body shall include officials of these agencies, representatives of public organisations and leading scientists. The co-ordination council shall also exercise the functions appertaining to:

- the organisation of the development of the general and regional schemes of the national ecological network development;

- the preparation of proposals related to the inclusion of the national ecological network in the General Zoning Diagram of the Territory of Ukraine as a special functional area;

- the preparation of proposals on the adjustment hereof, if necessary;

- the organisation of the compilation of the national report on the status of the development of the national ecological network once in 5 years.

13. Information about the Status of the National Ecological network and the Public Participation in the Development Thereof

In order to increase the level of the ecological education and training, and environmental awareness of the population, to make more active its participation in the implementation of actions aimed at the development of the national ecological network, the Programme provides for the following:

- the support to the establishment of new and the involvement of the existing public environmental expert centres in activities aimed at making the society realise the significance of the problem of the preservation of the landscape diversity and the existence environments of plant and animal species;

- the development and the implementation of proposals concerning the involvement of the population in the actions aimed at the development of the national ecological network, including young people

and taking into account the experience of the out-of-school environmental education in the field of the generation of the environmental culture and awareness of the problems of the environmental protection.

Section IV. PROGRAMME IMPLEMENTATION STAGES

It is planned to implement the Programme till the year 2015 in two stages (2000-2005 and 2006-2015)/

At the first stage, it is planned to ensure the increase in the area of individual elements of the national ecological network, to apply economic levers of the support to their development in lands of all ownership forms, to develop the appropriate regulatory and legal framework, to undertake the necessary scientific research and take organisational actions.

At the second stage, it is planned to bring the area of the national ecological network to the level required for ensuring the environmental security of the country, commissioning a stable system of the environmental actions aimed at the preservation of the landscape and biological variety.

Section V. SOCIAL, ECONOMIC AND ENVIRONMENTAL RESULTS OF THE PROGRAMME IMPLEMENTATION

The Programme implementation will ensure the preservation and restoration of the landscape diversity and contribute to:

- maintaining the environmental balance on the territory of Ukraine;

- creating the natural conditions for the life and development of human beings in an environmentally balanced environment brought as close as possible to natural landscapes;

- preventing the irreversible loss of a part of the gene, demographic, cenotic and ecological pool of the country;

- ensuring the balanced and sustainable use of the nature in a considerable portion of the territory of Ukraine;

- developing the resource base for tourism, recreation and making the population healthier;

- increasing the natural resource potential in agricultural lands adjoining the national ecological network;

- improving the regulatory and legal framework of the environmental protection and harmonising the same with the international one;

- developing the Pan-European Ecological Network;

- ensuring the restoration of bio- and geochemical turnovers in the environment, reducing the threat of the degradation and the loss of fertility of lands;

- re-naturalising the lands withdrawn from the agricultural use;

- strengthening the co-ordination of activities of central and local executive agencies, local self-administration bodies, public environmental organisations in the field of the solution of problems of the environmental security of Ukraine.

Annex 3

Approved by the Law of Ukraine
22 March 2001, No 2333-III

NATIONAL PROGRAM FOR THE PROTECTION AND REHABILITATION OF THE ENVIRONMENT OF THE AZOV AND BLACK SEAS

CONTENT

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I. Introduction

National Program for the Protection and Rehabilitation of the Azov and Black Seas (hereinafter the Program) in aimed at the implementation of the Convention on the Protection of the Black Sea Against Pollution (1992, ratified in 1994), the Ministerial Declaration on the Protection of the Black Sea (1993) and Black Sea Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (1996).

II. Terms and Definitions

The following terms and definitions are used in this Program:

Aquaculture – a system of measures for artificial reproduction of commercially valuable plants and animals in the aquatic environment

Aquatoria – water area of water body or sea, limited by natural, engineering or conditional boundaries

Biogenic substances – ions of nitrogen, phosphorus, silica, oxygen and carbon that are essential for the functioning of living organisms

Pollution sources, diffuse – sources of potential release of pollutants and biogenic substances into water bodies due to surface

runoff from a catchment area

Pollution sources, point – sources of potential release of pollutants and biogenic substances into water bodies caused by local definite discharges

Eutrophication – increase of the content of the biogenic compounds in a water body resulting in a vigorous growth of algae, the reduction of the water transparency and dissolved oxygen in the deep water layers due to the decomposition of the organic matter of the plants and the animals, as well as the deaths of the bottom organisms;

Ecosystem (ecological system) – a natural system created by the living organisms and their habitats interrelated via the exchange of the substances and energy that create the a system of interrelated biological and abiotic phenomena and processes;

Ecosystem, benthic – ecosystem of the subsoil of the water bodies and solid anthropogenic substrates (for example, collectors for molluscs in aquaculture, ship hulls, etc);

Ecosystem, marine –a system of the interacting living marine organisms and the marine environment;

Zooplankton –a group of animals that live in the water column and are not capable to resist a transfer by the currents

Resources, biological – biological components of the biosphere that may be used for the human consumption and other purposes

Resources, recreational – subjects and phenomena of a natural or anthropogenic origin that are used for the rehabilitation, recreation and tourism

Coastal zone – a part of the contact strip between the land and the sea that consists of the natural environment of coast and adjacent sea.

III. Goal and Period of the Implementation of the Program

The Goal of the Program is the development of national policy, strategy and action plan aimed at prevention of growth of human pressure on the environment of the Azov and Black Seas, the promotion of environmentally safe economic activities in the Azov and Black Seas regions, the creation of favourable conditions for living, rehabilitation and recreation of the populace.

The subject of the Program is the environment of the Azov and Black Seas within the boundaries of inner marine waters, territorial seas, exclusive (economic) zone and coastal zone of Ukraine.

The implementation of the Program is planned for the period of 2001-2010 and will be done in two phases - 2001-2005 and 2006-2010.

During the first phase it is foreseen to implement the organizational, regulatory and legal, scientific and technological measures aimed at the solution of the most urgent environmental problems, the successful and efficient introduction of new environmentally friendly technologies, construction of waste treatment facilities, coast protection, prevention of landslides, reconstruction of sewer pipeline networks through the incorporation of these measures in the annual plans of social and economic development of Ukraine.

IV. Present State of the Environment of the Azov and Black Seas

The Azov and Black Seas are the most isolated seas of the World Ocean on the Earth with catchment area near 2 million km^2.

In the Black Sea the territorial waters of Ukraine cover the area of 24850 km^2, the shelf area comprise almost 57 % of the total Black Sea shelf. Within the Ukrainian borders there are 14 most important limans

(bays) and estuaries of area 1770 km^2, 19 wetlands of 6350 km^2.

Poor conditions of the Azov and Black Seas resulted from the excessive loads of pollutants over the assimilatory capacity of marine ecosystems that resulted in the vigorous development of the eutrophication phenomena, significant pollution (including microbiological) of marine waters, losses of biological species, reduction of fish resources, worsening the quality of recreational resources, threats to the human health. Main pollution sources are the riverine discharges, wastewaters of point and diffuse sources, marine transport.

The very dangerous for marine ecosystems are point sources of industrial and municipal enterprises located in the coastal zone. Annually the municipal enterprises discharge more than 33.8 t of suspended solids, 8.8 th.t of nitrogen, 2.6 th.t of phosphorus, 24.1 th.t of oil. Insufficient capacity of municipal biological wastewater treatment facilities in towns and settlements of the Autonomous Republic of Crimea, cities of Mykolaiv, Odesa, and Sevastopol exceeds 273 th.m^3 per day. In the centralised water sewer system in the settlements of the coastal zone almost 25% of sewer pipelines are dangerously worn out..

The most serious concerns are related with the state of the Sea of Azov. Its most important polluters are 66 enterprises of the city of Mariupol,. The metallurgic consortium "AzovStal", "Illich", consortium "Azovmash" discharge over 800 ml.m^3 (almost 99% of total discharges) of the polluted wastewaters.

Every year the rivers of Ukraine bring 653 th. tons of suspended solids, near 8 tons of organic matter, about 1900 tons of nitrogen and 1200 tons of phosphorus. The streams of Crimea, Azov coastal zone, and Black Sea coastal zone bring into the seas 11.6 % of not assimilated nitrogen fertilizers, 13% of phosphorus fertilizers and 6 % of pesticides.

The constantly growing intensity of national and international navigation poses the increased risk of the pollution for the marine environment, in particular from transportation of the hazardous cargos.

An insufficient capacity of the necessary port facilities for the storage and processing of environmentally hazardous cargos along with an insufficient number of the installations for wastewater treatment and solid waste utilization on the vessels result in the heavy pollution of the maritime waters and harbours.

The poorly equipped emergency response and rescue teams for extraordinary situations, an absence of the system for a control of transportation of hazardous cargos in the marine waters require to develop the measures for the prevention of the accidents and the creation a system of the quick response and rescue on the national and international levels.

The large amount of the solid household and industrial wastes was accumulated within the water protection (buffer) zone of the Azov and Black Seas. A technologically inadequate design of the landfills caused the pollution of the surface and ground waters, degradation of recreational resources, and worsened the population health,.

The significant anthropogenic loads in the summer periods at some places of the recreational zones disturbed the natural conditions of beaches, coastal meadows and worsening of their recreational and rehabilitating ability.

Translocation of the large amounts of the bottom sediments during the deepening of navigational canals and sea bed cleaning affects the benthic biocenoses and causes the pollution of the marine environment

with the fine silts and toxic substances. In 1998 about 2600 m^3 of the bottom sediment were dumped at the marine dumping sites.

Unsustainable economic activity caused the reduction of the fish fodder resources, the number of spawning grounds, the number of fish feeding grounds and the habitats of fish and other marine aquatic organisms. Due to the overfishing and overharvesting of other marine living resources, the unsatisfactory enforcement and implementation of measures for the protection on their biological productivity impoverishing of the species composition occurred. The additional disturbance was caused by the invasion of harmful exotic species that suppressed the development and renewal of the indigenous flora and fauna of the Azov and Black Seas.

Oil is considered as one of the priority pollutants of the marine environment, especially within the harbours. In the Odesa, Illichivsk, and Kerch ports the concentrations in water column exceeded the maximum allowable concentrations (hereinafter – MAC) by 1.5 - 2.0 times.

In the Sea of Azov the oil concentrations in the marine waters sometimes exceed MAC by tenfold.

The bays of Sevastopol are the most heavily polluted due to the activities of the Russian Navy Fleet. During the recent years in the Pivdenna, Kamyshovaia, Holland, Karantinna, Pivnichna harbours the annual average concentrations in the surface stratum of the marine waters exceeded MAC three– to tenfold.

Pollution of the coastal waters of the Black Sea with detergents in the impact zone of municipal water treatment facilities exceeded MAC by two – threefold.

An occurrence of elevated contents of organochlorine pesticides and polychlorinated byphenils was reported for the estuary zones of rivers in the springtime.

Sometimes, the high concentrations of heavy metals (copper, chromium, lead, cobalt, zink, cadmium, stroncium, etc), a periodical occurrence of cesium –137 were reported for the eastern and central parts of the Black Sea In the past years the contents of radionuclides in the Sea of Azov was higher than MAC by 12.6 times, concentrations of phenols – 7 times.

Regardless of the significant reduction of the quantity of the applied pesticides and fertilizers in agricultural sector, an average content of phosphorus in the waters of the Azov and Black Seas varies between 10-40 μg per l near the southern coast of Crimea to 600 per l in the estuary of the Danube River. In the Sea of Azov the content of nitrogen ranged between 20-28 and 400 μg.

In the past years the conditionally pathogenic and pathogenic microflora pollution increased that resulted in the severe disturbance in the marine and coastal ecosystems, namely:

Water transparency reduced more than twofold (to 2-8 m);

Hypoxic zones expanded from 3 to 40 thousand km^2;

The areas of algal 'blooms' developed by 20 times comparing to those observed in the 1960s in the northwestern part of the Black Sea;

An abundance of protozoans and coelenterates as well as the harmful exotic species increased. In the beginning of the 1990s the total biomass of the comb jelly (ctenophore) **Mnemiopsis leidyi** *was assessed at 1 billion tons;*

Areas of macrophytes of the coastal shallow waters shrunk to 3-5 m;

The marine biological resources decreased significantly;

The hypoxia and mass death of the benthic biocenoses were wide spread over the significant areas (during past 20 years the losses of the bethic fauna, including fish, were estimated as 60 mln.tons, for fish – about 3 ml.tons);

A number of the marine mammals decreased by 20 times;

The famous Phyllophora (red alga) field (Zernov's field) has almost disappeared at the north-western shelf of the Black Sea;

In the past 10 years the fish catches reduced by 5 times in the Azov and Black Seas.

The damage to the human health of coastal population is evident. Due to the pollution and the insufficient quantity of the drinking water of the good quality, the cases of viral hepatitis and other infections were annually reported for the Autonomous Republic of Crimea, Doneska, Mykolaivska, Khersonska regions and the city of Sevastopol.

The poor quality and hygienic conditions of the bathing waters and beaches affected the number of tourists in the resorts, the tourist facilities, other places of recreation. The losses from worsening of the recreational value of the coastal recreational resources were estimated as high as 9 mln. Hryvnia per year (≈ 1.8 mil. USD).

To the great extent the potential of aquaculture is underused although along with the seafood supply it plays an important role in the renewal of resources and the sustainable development of the region.

The fisheries in the Azov and Black Seas declined dramatically. The fish catches in the recent years consisted of 20% of the 1960s-begginning of the 1970s resulting in the annual losses of the commercial products of ≈75 mln.USD.

Almost 2.6 thousand km of coastline were affected by the surface runoff and erosion that questioned its suitability for the urban and tourism development and negatively affected the costal ecosystems.

V. Main Problems of the Azov and Black Seas and Directions for Their Solving

The main problems of the ecological state of the Azov and Black Sea are:

High pollution level of the marine waters;

Threat to the human health and the irreversible losses of the biological diversity and biological resources;

Reduction in the fish catches and harvesting of the marine products;

Worsening of the quality of the recreational resources;

Coast abrasion and the intensive negative geological process;

Degradation of lands of the coastal zone;

Absence of the integrated coastal zone management;

Threat of the extinction of the plants and animals that are included in the Red Data Book;

Reduction of an artificial fish breeding for the commercially valuable fish species.

The Program defines the following major directions for solution of environmental problems of the Azov and Black Seas:

1. Reduction of the pollution levels and anthropogenic pollution loads on the ecosystems;

2. Reduction of a risk for the human health related with pollution of marine waters and coastal zone;

3. Conservation and rehabilitation of the biological diversity, the natural landscapes of coastal zone and the habitats, the expansion of the network of state sanctuaries, reserves, the creation of the national parks;

4. Sustainable development and renewal of the marine biological resources and the development of aquaculture with a particular emphasis on the commercially valuable fish species under the adequate system of the state control;

5. Prevention of the coast abrasion and the improvement of land conservation in the coastal zone of Azov and Black Seas;

6. Creation of a system of the integrated coastal zone management within the water protection (buffer) zones, the coastal zones, the marine territorial waters;

7. Improvement of the monitoring system for the environmental impact assessment of the natural and human factors;

8. Involvement of the public in the implementation of nature protection measures, raising the environmental education and awareness of the populace;

9. Improvement of legislation, regulations and legal acts for the implementation of the state policy in the protection of the environment of the Azov and Black Seas, its harmonization with the requirements of the enacted international agreements the mandate for which is given by the Verkhovna Rada of Ukraine.

VI. Environmental Protection Measures Aimed at Phased Improvement of the Environmental State of the Azov and Black Seas

For the improvement of the environmental state of the Azov and Black Seas the following measures are planned.

1.1. **Reduction of Pollution Loads from Riverine Inputs**

During the first phase it is envisaged:

Accepting a basin wide approach to the protection and rehabilitation of the Azov and Black Seas, to coordinate measures of this Program with the programs and the action plans aimed at the improvement of the environmental state the river basins of the Dnipro, Danube, Dnister, Southern Bug, Siversky Donets, and the streams of the coastal zone of Azov and Black Seas during a preparation of the annual draft programs for the economic and social development of Ukraine;

Development of the measures for the protection and rehabilitation of the Danube lakes, Sasyk Lake, and limans of the northwestern Black Sea area;

Development of the measures for the ecological rehabilitation of the river mouths using the biological amelioration ability of the wetlands;

Preparation of the regional (for Ukraine) projects for the protection of streams of the coastal zone of the Azov and Black Seas;

Development of a legal act for the special regime of nature use in the wetlands and mouths of the rivers;

Coordination of the measures of the Program with the National Program on the Establishment of the National Ecological Network, 200-2015, the Program for the Prospective Development of the Nature Conservation in Ukraine.

During the second phase it is foreseen:

Implementation of the measures aimed at the ecological rehabilitation of the mouths of the Danube, Dnipro, and Dnister rivers using the biological amelioration ability of the wetlands

;

Implementation of the regional programs and pilot projects for the rehabilitation and cleaning up of the streams of Crimea, the coastal zones of the Azov and Black Seas;

The Program foresees strengthening the control of the pollution loads that are discharged into the seas through the mouths of the rivers of the first order, encouraging the public participation in a control of pollution of the streams of Crimea, the coastal zones of the Azov and Black Seas, and other measures.

1.2. Reduction of the Pollution from the Point Pollution Sources .

During the first phase is envisage:

Inventory of the discharges of the polluted municipal and household wastewaters within the costal zone and an identification of the most dangerous polluters;

Development and approval of an action plan for the necessary measures in order to reduce the pollutant loads;

Achievement of the compliance of wastewater treatment quality with the norms and standards in the places where they adversely affect the sanitary and hygienic conditions of the seas;

Development of a pilot project for achieving the necessary level of the wastewater treatment for a compliance with the regulatory allowable norms in one of the coastal cities of the Azov and Black Seas;

Introduction of the modern technologies for recycling and utilization of the wastes produced by the wastewater treatment facilities;

Development and implementation of the special programs for the prevention of the pollution in the ecologically most disturbed cities, in particular the city of Mariupol and the adjacent territories of the coastal zone of the Sea of Azov.

During the second phase it is foreseen:

The complete cessation of the discharges of the polluted waters by the enterprises of the coastal zone into the Azov and Black Seas;

Introduction of the circulating, recycling, and sequential water uses in the technological processes of the enterprises located in the coastal zone;

Achieving the compliance of the wastewater treatment with the norms and standards.

1.3 **Reduction of the Pollution Loads from the Diffuse Coastal Sources**

In the first phase the Program envisages:

Development of a methodology for the scientifically valid assessment of the pollutants loads from the diffuse pollution sources into the marine waters and the identification of the criteria for an assessment of their impacts on the state of the environment of the Azov and Black Seas;

Creation of a system for monitoring of the inputs of heavy metals, organic substances, and pesticides from the urban runoff and the military activities;

Development of the measures for the prevention of the pollution of the marine waters by collector and drainage waters;

Establishment of the water protection (buffer) zones and the coastal protection zones of the seas, the sea lagoons, the limans and the streams;

Public campaigns for cleaning up the territories of the protection zones of the seacoast.

In the second phase the Program foresees:

Improvement of the existing collecting system for the storm waters in the settlements of the coastal zone of the Azov and Black Seas;

Improvement of the drainage water collecting system on the agricultural lands and the resistance to the erosion of the landscapes;

Implementation of the measures aimed at the prevention of the marine pollution by the collector and drainage waters

Establishment the water protection zones and the coastal protection zones of the seas, the lagoons, the limans, and the streams.

1.4. **Reduction of the Airborne Pollution Loads**

During the first and second phases the Program foresees:

Inventory of the sources of the airborne pollution and the assessment of the pollution loads from the stationary and mobile sources in the seas and the coastal zone;

Assessment of an impact from the atmospheric precipitations ;

Implementation of the environmental control for the compliance with the emission norms from the mobile sources in the coastal zone of the Azov and Black Seas.

1.5. **Creation of the Unified System for the Control of the Movement of the Hazardous Substances by the Marine Transport, Prevention of Pollution of Marine Waters from Vessels**

During the first and second phase the Program foresees:

Implementation of the control of the construction and operation of the facilities for a reloading and a storage of the oil products, chemical substances, etc.;

Development and the implementation of a system of the control of the movement of the hazardous substances within the marine borders of Ukraine;

Development and the implementation of the measures aimed at the prevention of an introduction of the harmful exotic marine organisms by the vessels in the Azov and Black Seas;

Implementation of the pilot project on the introduction of the biological treatment of oil pollution in the waters of the marine harbours;

The Program foresees the implementation of an utilization of the liquid and solid wastes on the vessels, the transport means in the ports; the creation of an information system for the forecasting of the movement of the oil spills on the sea surface and other measures.

1.6. Improvement of a System of the Household and Industrial Solid Wastes Accumulated in the Coastal Zone.

During the first phase it is foreseen:

Inventory of the landfills of the garbage and solid wastes within the 2 km coastal protection zone of the Azov and Black Seas and the development of the measures aimed at their elimination;

Development of the sector programs of the environmentally safe management of the waste bottoms sediments that are produced in the ports;

Putting into an operation the capacities for the burial, processing, and utilization of the solid household and industrial

wastes;

Development and the implementation of a pilot project for the inventory and recycling of household solid wastes;

During the second phase the Program foresees:

Relocation of the landfills and solid wastes outside of the boundaries of the protection coastal zone of the Azov and Black Seas;

Construction of the capacities for the burial, recycling, and utilization of the solid household and industrial wastes;

Implementation of the sector programs of the ecologically sustainable management of the bottom sediment wastes in the harbours;

Establishment of the criteria for the pollutants in the bottom sediments that are released during deepening of the navigation canals and cleaning up of the seabed.

The Program foresees the implementation of the measures for the identification of the technologies for the utilization of the wastes of the bottom sediments and the reduction of the silting of the seabed and marine pollution released during the deepening of the navigation canals and cleaning operations of the sea bed, the identification of the disposal sites of the wastes of the bottom sediments at the lands during the strengthening of the seacoast and the construction works; the creation of an information and consulting center for the introduction of the ecologically friendly technologies and the installations for the recycling of the wastes.

1.6. **Measures Aimed at the Prevention of Extraordinary Situations and Improvement of Means for Mitigation of Their Consequences.**

During the first phase it is envisaged:

Increase of the efficacy of the measures for the prevention of the accidents of the offshore installations and vessels; the improvement of the measures for the mitigation of the consequences of the accidents and the extraordinary situations in the seas;

Development of the national contingency plan for the quick response in the extraordinary situations of a technogenic or natural character and the adaptation of it to the regional action plan of the Black Sea states;

Introduction of the unified state system of the early warning and quick response in case of the extraordinary situations in the Azov and Black Seas;

Development of the forecasting system of the state of marine environment, the hydrometeorological and hydrographical observations for the movement of hazardous cargos by the marine transport.

In particular, during the first phase it is foreseen:

Development and the introduction of the measures for the fundamental investigation of the water column saturated with hydrogen sulphide, a fundamental scientific study on possibility of utilization of hydrogen sulphide;

Organization of the special state accident and rescue service for the mitigation of the consequences of extraordinary situations in the seas with the sufficient provision of the modern equipment, the training grounds and the training centers;

Creation of the subunits of the operational monitoring for obtaining the operative information for the decision making in case of the emergencies and the extraordinary situations in the Azov and Black Seas;

Introduction of a compulsory insurance of the risks of the environmental damages related with the transportation, storage and use

of the environmentally hazardous substances in the waters of the Azov and Black Seas.

2. Reduction of Risk for Human Health from Pollution of Marine Waters and Coastal Zone

2.1 Preventive Measures Against an Adverse Impact on the Human Health in the Sites of the Recreational and Rehabilitation Water Uses.

During the first and second phases it is envisaged:

Implementation of monitoring of the existing pollution of the marine environment in order to identify the areas for the priority protection measures, the favourable zones for the water use and aquaculture development

Identification of the sources of an adverse impact on the coastal marine waters within the settlements, the recreational zones and the sites of aquaculture farming

Development of the measures aimed at the reduction of the adverse impact of the pollution sources on the population health

Optimal use of the coastal territories for the recreational purposes

1.2 Information of the Populace about the Sanitary and Hygienic Conditions and the Epidemiological Situation of the Recreational Zones and the Settlements of Ukraine

During the first phase it is anticipated:

Creation of a database for the quality of the drinking water, air, beach waters for recreational purpose and settlements.

Development of a prediction model on the epidemiological, sanitary and hygienic conditions in order to implement the efficient preventive measures

During the second phase it is foreseen to provide operational information for the populace on the sanitary and hygienic conditions within the boundaries of the recreational zones and the settlements in a case of the threats of worsening of the environmental conditions and the spreading of the infectious diseases.

3.Conservation and Rehabilitation of the Biological Diversity, the Natural Landscapes of the Coastal Zone, and the Habitats of Biological Species

3.1. During the first phase it is envisaged:

Development of a special procedure for the nature use at the territories (aquatoria) of the wetlands of the international importance;

Preparation of the scientifically valid recommendations for the rehabilitation of the relict species of the flora and fauna of the Azov and Black Sea;

The intensive fundamental and applied scientific research works aimed at investigation of the basic relationships of the functioning of the marine and coastal ecosystems and the prevention of the adverse factors that affect those processes as well as the conservation of the biological diversity of the Zernov's field;

Implementation of the measures aimed at the creation of the Azov-Black Sea natural (ecological) corridor;

Creation of two biological stations (in the Azov and the Black Sea) for the conservation and the rehabilitation of the rare species of plants and animals that listed in the Black Sea Red Data Book.

During the second phase it is foreseen:

Based on the existing nature and biosphere reserves to create the national parks, other territories and subjects of the nature conservation fund, the centers for the rehabilitation of the rare species of plants and animal that are listed in the Red Data Book of Ukraine;

Development of a project for the rehabilitation of the areal of phylophora alga stands (Zernov'ss phylophora field);

Introduction of the rare and endangered species of plants and animals;

Development and implementation of the measures aimed at the protection of the waterfowls, their habitats, and the nesting sites by the creation of the specially protected territories;

Implementation of the measures for the prevention of the introduction of the new species of plants and animals harmful for the local flora and fauna.

In addition, it is envisaged:

Implementation of the measures for the conservation of the marine mammals within the inner marine waters and the territorial sea (including the creation of the rehabilitation centers);

Investigation of the small Phyllophora *field in Karkinitska Bay and water space nearby the island Zmiiny (Snake Island);*

Implementation of the measures for the rehabilitation of the endangered marine plants and animals in the water area of the Azov and Black Seas;

Participation in the updating the regional Black Sea Red Data Book in the framework of the Black Sea Environmental Program for the Protection of the Black Sea.

3.2 Conservation of the Habitats of the Biological Species

During the first phase it is foreseen:

Further expansion of the area of the protected territories and the subjects of the nature and reserve fund and their organization;

Improvement of the legislation on the nature and reserve fund by introduction the new categories of the territories and the subjects of nature and reserve funds in order to protect and rehabilitate the natural resources of the coastal zones and the open sea;

Development of the special procedures for the nature use at the protected territories and subjects of the nature and reserve fund;

Limitation of an economic activity in the habitats of the biological species that are attached to the substrates;

During the second phase the creation of a biological station for the investigation of the conservation of the biological diversity of the marine and terrestrial species is envisaged.

4. Sustainable Use and Rehabilitation of the Biological Resources and Development of Aquaculture

During first and second phases it is foreseen:

Improvement of the legislation on the management, the protection, the use and the rehabilitation of the fish stocks in the Azov and Black Seas;

Breeding of the populations of marine plants and animals that have the commercial value and an assessment of their importance as a resource;

Development of the mechanism for sustaining at the optimal level the number of the fish eating birds and the marine mammals;

Fundamental and applied scientific studies for the rehabilitation and an enrichment of the marine biological resources of the Azov and Black Seas, the introduction of the corresponding ecologically safe technologies;

Construction and renovation of the fish nurseries, the state budgetary support to breeding of the commercially valuable fish species, including the resources of the state and local funds for the environmental protection;

The substantiation of the merits of the development of the species and the identification of the most suitable sites for the aquaculture development in the coastal zone;

Identification of the ecologically safe sites for the cultivation of the aquaculture organisms that are attached to substrates;

Creation of the aquaculture farms in the coastal zone of the Azov and Black Seas;

Information of the populace of the coastal zone about the technologies and the economic benefits of the fish breeding and the aquaculture farms;

Rehabilitation of the marine resources suitable for harvesting of the raw pharmaceutical products;

Participation of Ukraine in the development of the Fisheries Convention that is being prepared by the Black Sea countries;

Development and the implementation of the measures aimed at the recreation of the fish resources in the Sea of Azov;

The development of the measures aimed at the improvement of the nursery grounds, the feeding grounds and the fodder resources is also envisaged as well as the protection of the fish migration routes and other measures aimed at the replenishment of the biological resources and their sustainable use.

5. Prevention of the Coast Abrasion and the Land Conservation in the Coastal Zone

5.1 Protection of the Seacoast Against the Destructive Geological Processes and Abrasion

During the first and second phases it is foreseen:

Development of the national and local programs for the protection of the seacoast;

Implementation of the projects for the protection of the seacoast from destruction, the construction of the facilities that do not disturb the natural processes, the biologically friendly coast regulatory systems.

5.2 Conservation of the Lands of the Coastal Zone

During the first and second phase it is envisaged:

Reservation of the lands for their future use in the recreational and rehabilitation purposes;

Improvement of the structure of the agricultural lands and the creation of the ecologically sustainable agricultural landscapes;

Introduction of the soil conservation systems of the land cultivation with the contour melioration of the irrigated fields;

Recultivation of the disturbed lands based on the ecological landscape principles;

Conservation of the degraded agricultural lands;

Improvement of the environmental state of the irrigated lands;

Creation of the protective forest stands in the coastal zone of

seas.

6. Creation of the Integrated Coastal Zone Management for the Sustainable Nature Use

6.1. Creation of the System of the Integrated Management for Nature Use

During the first phase it is envisaged:

Establishment of the boundaries of the Coastal Zone;

Development of a scheme for the functional zoning of the coastal zone with the identification of the territories suitable for the different economic activities;

Development of the management principles and the improvement of the economic mechanism of the nature use;

Development of the corresponding regulatory and legal base in order to create and make functional the special zones situated along the seacoasts of the Azov and Black Seas.

During the second phase it is foreseen:

Development of the principles of the national policy and the strategy for integrated coastal zone management and the action plan and their implementation.

6.2. Nature and Landscapes Complexes for Tourism Purposes

During the first phase it is foreseen:

Development of a procedure for the establishment of the boundaries and the provisions for the districts of the sanitary protection of the resorts, as well as the sanitary water protection zones that are used for the rehabilitation and recreational purposes in the coastal zone of the Azov and Black Sea;

Creation of the Cadastre of the natural recreational resources of the marine coast;

Identification of the environmental carrying capacity for tourist activities within the boundaries of the recreational zone;

During the second phases the opportunity will be studied for:

Introduction of a system of the environmental certification of the subjects of tourist activities and information on its merits;

Development of the ecological (green) tourism.

7. Improvement of the Monitoring System and the Assessment of Environmental Impacts of the Natural and Anthropogenic Factors

7.1. Investigation of the State and Monitoring of the Pollution of the Azov and Black Seas

During the first phase it is foreseen:

Designing of the optimal monitoring network in the areas of the most serious anthropogenic impacts;

Development of a structure and a program for the monitoring of the marine environment;

Implementation of the hydrological monitoring and the systematic basic seasonal observations;

Creation of a system of the operational monitoring of the ecological state of the marine environment in the damping sites;

Development of the ecological quality criteria for the marine environment of the Azov and Black Seas and the harmonization of these with the international criteria.

During the second phase it is foreseen:

Implementation of the regional monitoring system of the marine environment (baseline and routine monitoring);

Implementation of the ecological criteria of the environmental quality of the Azov and Black Seas;

Creation of the Geographic Information System of the Ukrainian part of the Azov and Black Seas

Creation of the monitoring system for the bathing waters and the beaches in order to certify them in accordance with international standards.

7.2 Environmental Impact Assessment

During the first and the second phase it is envisaged:

Development and implementation of the methods for the assessment of the environmental impact of the pollution on the marine waters and the coastal zone, including the impacts of the mining and highly mineralised tailings, discharges of irrigation systems on the environment and human health;

Development of a provision on the environmental audit of the subjects of the coastal zones and the economic mechanisms for its introduction;

Development of the measures for the improvement and the harmonization of the environmental impact assessments of the anthropogenic origin.

8. Involvement of the Public in the Implementation of the Environmental Protection Measures, Raising of the Environmental Education and Public Awareness

During the first and second phases it is envisaged:

Promotion of the creation of the associations of the non-governmental environmental organizations, the public organizations of the coastal zone, the coordination of their activity and the strengthening of the international cooperation in the protection and rehabilitation of the ecosystems of the Azov and Black Seas

Support to the environmental protection actions that aimed at the protection and conservation of the environment of the Azov and Black Seas on the national, regional and local levels;

Publications of a specialized journal on the environmental problems of the Black Sea and other popular and scientific literature;

Raising of the environmental education and awareness of the public.

VII. Mechanism of the Implementation of the Program

Political Measures

In order to create the favourable conditions for the implementation of the Program it is envisaged to include the solution of the problems of the protection and rehabilitation of the Environment of the Azov and Black Seas in the priorities of the social and economic development of Ukraine and to implement the measures aimed at attracting the attention of the international community to this problem .

Regulatory and Legal Measures

The regulatory and legal acts dealing with the reduction of the marine pollution, the anthropogenic loads on ecosystems, the risk for the human health related with the marine and coastal pollution, the

conservation and rehabilitation of the biological diversity, the natural landscapes, and the habitats of biological the species, the development of aquaculture, the prevention of the coast destruction, the creation of the integrated coastal zone management system in the Azov and Black Sea, the development of ecological (green) tourism) - envisaged to be developed and enacted in order to implement the Program.

The corresponding changes are foreseen in the Water Code of Ukraine, the Land Code of Ukraine, the Law of Ukraine On the Nature and Reserve Fund, the Law of Ukraine on the Exclusive (Economic) Zone of Ukraine and other regulatory and legal acts in order to protect the rehabilitation and recreational resources of the coastal zone.

Organizational Measures

Organization and coordination of the activities for the implementation of the Program are delegated to the specially authorised central executive body on the environment and natural resources of Ukraine involving the concerned central and local executive authorities in accordance within their responsibilities.

For the coordination of the activities of the central and local executive authorities, scientific and public organizations - stakeholders of the Program – the steering committee – Interagency Commission for the Environment of the Azov and Black Seas (hereinafter – the Interagency Commission) consisting of the official representatives of above institutions, the prominent scientists, the representatives of the sectoral committees of the Verkhovna Rada, as well as representatives of public organizations shall be established.

The Interagency Commission has a mandate to propose the changes in the measures envisaged by the Program if necessary taking into account the available financial, material and organizational resources.

Annually, during the preparation of a draft state program of the social and economic development of Ukraine, the State Budget of Ukraine, financial resources and their sources for the Program shall be revised by the Interagency Committee and by specially authorised executive body for the environment and natural resources taking into consideration the available financial resources of the state.

Scientific Measures

Scientific measures envisaged in the Program are as follow:

Fundamental studies for the investigation of the natural processes in the ecosystems of the Azov and Black Seas and the applied research studies for the development and the implementation of the measures aimed at the pollution reduction, the conservation, the rehabilitation and the replenishment of the biological resources, the improvement of the recreational ability of the region;

Improvement of the economic mechanism for the nature use;

Creation of the corresponding databases based on the GIS technologies;

Improvement of the monitoring system;

Preparation of the methodologies, the scientific recommendations for the implementation of the environmental policy on the use of the marine resources;

One of the priority tasks of the Program is the urgent development of an Integrated Program of the Scientific Investigations on the Protection and Rehabilitation of the Environment of the Azov and Black Seas.

Estimated Costs and Financing of the Program

The Program will be financed from:

The State Budget of Ukraine, the republican budget of the Autonomous Republic of Crimea, corresponding local budgets (taking into account the environmental protection measures that are financed in the framework of on-going environmental programs), the environmental protection funds incorporated in the budgets of all levels, as well as other financial sources, including the finances of the subjects of the economic activities;

The insurance funds of the ecological risks from the extraordinary situations that adversely affect the environment;

External and domestic loans;

Grants of the international organizations, the donations, the funds of international programs, etc.;

Improvement of the mechanism of the distribution of the payments for the natural resources use by the subjects of the economic activity.

Implementation of the Program envisage the following tasks:

Urgent investments and non-investment measures on the protection and the rehabilitation of the Black and Azov Sea (Annexes 1 and 2);

Measures for the protection of the coasts of the seas and limans (Annex 3);

Measures for the monitoring and assessment of the state of the environment of the Azov and Black Seas (Annex 5);

Development of regulatory and legal acts (Annex 6).

Financing mechanism of the Program during the second phase foresees the creation of a target fund where all available financial resources will be accumulated and allocated on the implementation of the environmental protection measures of the Program including the additional finances for its implementation, namely:

Development of the tax system related to the nature use and the environmental protection;

Improvement of the pricing policy for the utilities in the municipal sector for the improvement of the investment opportunities of the municipal and other enterprises;

Establishment of the adequate payments for the environmental damage and the natural resources use;

Creation the conditions for the dynamic development of tourism, fisheries, the growth of the transport services and other profitable activities;

Attraction of the finances of the international organizations (International Black Sea Fund, Global Environmental Facility, TACIS Program).

Total revenues from the international sources for the implementation of the Program are expected between 90 –120 million USD.

Simultaneously, along with the improvement of the enacted economic mechanism for the nature use, the additional sources of the financing of the Program shall be introduced such economic tools as the insurance of the environmental risks, the leasing of the environmental equipment, the attraction of the low cost loans, the grants, the market of the environmental works and services, etc.

Control of the Program Implementation

Control of the implementation of the Program shall be implemented by the specially authorised central executive body on the environment and natural resources according to the identified directions and tasks.

The Cabinet of Ministers shall inform the Vekhovna Rada of Ukraine about the success in the implementation of the Program twice a

year.

The body that coordinates the implementation of the Program shall submit a report on the implementation of the measures and tasks of the Program annually.

According to the recommendations of the Interagency Commission, the Cabinet of Ministers shall amend the measures envisaged by the Program and the scope of their financing.

VIII. International Cooperation

The international cooperation in the environmental protection and rehabilitation of the environment of the Azov and Black Seas will promote the harmonization of the national environmental legislation with the European legislation and foresee the development of the legislative base of the cooperation on the regional environmental policy, the improvement of the compliance with international agreements in order:

To develop the bilateral cooperation with the countries in the Black Sea region in the environmental protection, the protection and use of the transboundary watercourses in the Black Sea basin, the prevention and the mitigation of the consequences of the extraordinary situations.

To ensure the fulfilment of the international agreements that regulate activities, related to the protection of the seas (on the Nuclear Weapons on the Seabed Treaty, Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, Convention on Protection of the Black Sea Against Pollution);

To ensure implementation of the provisions of the conventions that regulate the transboundary movement of the pollutants (airborne and riverine) and anthropogenic environmental impact, including the marine environment (Convention on Long- Distance Transboundary Air Pollution and its Protocols, Convention on Protection and Use of Transboundary Watercourses and International Lakes, Convention on Environmental Impact Assessment in a Transboundary Context);

Ratification of the Convention on the Protection and Sustainable Development of the Danube River, as well as the conventions aimed at the conservation of the biological diversity, the protection and sustainable use of the biological and land resources (Convention on Biodiversity, Convention on Wetlands of International Importance mainly as habitats for waterfowl);

To ensure the signing and the ratification of the ACCOBAMS;

To participate in the development of the Protocol on Conservation of Biological and Landscape Diversity to the Convention on the Protection of the Black Sea Against Pollution and the Convention on Fisheries and the Conservation of the Living Marine Resources of the Black Sea;

Preparation of the five years reports on the implementation of the Odessa Ministerial Declaration on Protection of the Black Sea;

To support and develop the methodological centers established in the framework of the Black Sea Environmental Program

In the framework of the Convention on the Protection of the Black Sea Against Pollution to ensure active participation of Ukraine in the implementation of the main directions of the Black Sea Strategic Action Plan, the development and the implementation of the interstate programs and the projects for the conservation of the environment of the Black and Azov Seas.

Development of the bilateral cooperation, first of all with the Russian Federation, for the protection and rehabilitation of the

environment of the Sea of Azov

Development of the joint Ukrainian –Russian integrated program for the protection and rehabilitation of the Sea of Azov with participation of the state authorities and the local self-governance authorities of the territorial and administrative units of Ukraine and the corresponding the state and local authorities and subjects of the Russian Federation that belong to the basin of the Sea of Azov as well as the Russian-Ukrainian Parliamentary Assembly for the Sea of Azov.

Annex 4

MAIN OBJECTS OF THE NATURE CONSERVATION FUND OF UKRAINE

No	NAME	SUBORDINATION (entity in charge)	ESTABLISHED	TOTAL AREA, ha	LAND AREA OF PERMANENT USE, ha
BIOSPHERE RESERVES					
1	Ascania-Nova (Askania-Nova)	UAAS (Ukrainian Academy of Agricultural Sciences)	1985	33307.6	11312.2
2	Chornomorsky (Black Sea) Biosphere Reserve	NASU (National Academy of Sciences of Ukraine)	1985	89129.0	70509.0
3	Carpathian Biosphere Reserve	Ministry of Environmental Protection	1993	53630.0	31977.0
4	Dunaisky (Danube) Biosphere Reserve	NASU	1998	46402.9	22662.0
NATURE RESERVES					
1	Crimean Reserve	State Administration Department	1923	44175.5	44175.5
2	Kaniv Reserve	T. Shevchenko National University	1923	2049.3	2049.3
3	Ukrainian Steppe Reserve	NASU	1961	2768.4	2768.4
4	Lugansk Reserve	NASU	1968	1575.5	
5	Polisky (Polissian) Reserve	State Committee of Forestry	1968	20104.0	20104.0
6	Yalta Mountain and Forest Reserve	State Committee of Forestry	1973	14523.0	14523.0
7	Cape Martian Reserve	UAAS	1973	240.0	240.0
8	Karadag Reserve	NASU	1979	2855.2	2855.2
9	Roztochya Reserve	Ministry of Education and Sciences	1984	2084.5	2084.5
10	Medobory	State Committee of	1990	10516.7	10516.7

	Reserve	Forestry			
11	Dniprovsko-Orilsky Reserve	State committee of Forestry	1990	3766.2	3766.2
12	Yelanetsky Steppe Reserve	Ministry of Environmental Protection	1996	1675.7	1675.7
13	Horhany (Gorgany) Reserve	Ministry of Environmental Protection	1996	5344.2	5344.2
14	Kazantypsky (Kazantyp) Reserve	Ministry of Environmental Protection	1998	450.1	450.1
15	Opuksky (Opuk) Reserve	Ministry of Environmental Protection	1998	1592.3	1592.3
16	Rivne reserve	Sate Committee of Forestry	1999	47046.8	47046.
17	Cheremsky Reserve	State Committee of Forestry	2001	2975.7	2975.7
NATIONAL NATURE PARKS					
1	Carpathian	Ministry of Environmental Protection	1980	50303.0	38591.0
2	Shatsky	State Committee of Forestry	1983	48977.0	18810.0
3	Synevyr	Ministry of Environmental Protection	1989	40400.0	27208.0
4	Azovo-Syvashsky	State Administration Department	1993	52154.0	52154.0
5	Vyzhnytsky	Ministry of Environmental Protection	1995	7928.4	7013.4
6	Podilski Tovtry	Ministry of Environmental Protection	1996	261316.0	3015.0
7	Svyati Hory (Sviati Gory)	Ministry of Environmental Protection	1997	40589.0	11878.0
8	Yavorivsky	Ministry of Environmental Protection	1998	7078.6	2885.5
9	Sokolivsky Beskydy	State Committee of Forestry	1999	35684.0	24702.0
10	Desniansko-Starohutsky	Ministry of Environmental Protection	1999	16215.1	7272.6

11	Uzhansky	Ministry of Environmental Protection	1999	39159.3	14904.6
12	Gutsulshchyna	Ministry of Environmental Protection	2002	32271.0	7606.0

Annex 5

INTERNATIONAL AGREEMENTS IN THE FIELD OF BIODIVERSITY RATIFIED BY UKRAINE

1.	*Convention on Conservation of Maritime Living Resources of Antarctica*	*Geneva, 1958, ratified in 1994*
2.	*Convention on the Protection of New Breeds of Plants*	*Paris, 1971, joined in 1995*
3.	*Convention on the Wetlands of International Importance, especially as waterfowl habitat (Ramsar Convention)*	*Ramsar, 1971, joined in 1996*
4.	*Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention).*	*Paris, 1972, ratified in 1988*
5.	*Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)*	*Washington, 1973, joined in 1999*
6.	*Pan-European Strategy on Biological and Landscape Diversity*	*Sofia, 1995*
7.	*Convention on Conservation of European Wildlife and Natural Habitats (Bern Convention)*	*Bern, 1979, ratified in 1999*
8.	*Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)*	*Bonn, 1979, joined in 1999*
9.	*Agreement on the Conservation of Populations of European Bats*	*Bonn, 1991, joined in 1999*
10.	*Protocol on the Environmental Protection to the Agreement on Antarctica*	*Madrid, 1991, joined in 2001*
11.	*Convention on Biological Diversity*	*Rio-de-Janeiro, 1992, ratified in 1994*
12.	*Convention on the Protection of the Black Sea Against Pollution*	*Bucharest, 1992, ratified in 1994*
13.	*United Nations Framework Convention on Climate Change*	*New-York , 1992, ratified in 1996*
14.	*Convention on Cooperation for the Protection and Sustainable Use of the Danube River (Danube River Protection Convention)*	*Sofia, 1994, ratified in 2002*
15.	*United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*	*Paris, 1994, ratified in 2002*
16.	***Memorandum of Understanding concerning Conservation Measures for the*** *Slender-billed Curlew,* Numenius tenuirostris	*Hague, 1995, signed by Minecoresources*
17.	*Agreement on the Conservation of African-Eurasian Migratory Waterbirds*	*Hague, 1995, ratified in 2002*
18.	*Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area*	*Monaco, 1996, joined in 2003*
19.	*Protocol on Water and Health to the 1992 Convention on*	*London, 1999,*

	the Protection and Use of Transboundary Watercourses and International Lakes	*ratified in 2003*
20.	*Cartagena Protocol on Biosafety to Convention on Biodiversity*	*Montreal, 2000, joined in 2002*
21.	*European Landscape Convention (Florence Convention)*	*Florence, 2000, to be signed*
22.	*Memorandum of Understanding on the Conservation and Management of the Middle-European Population of the Great Bustard*, Otis tarda	*Hague, 2002, signed by Minecoresources*
23.	*Black Sea Biodiversity and Landscape Conservation Protocol to the Convention on the Protection of the Black Sea Against Pollution*	*Sofia, 2002, to be ratified*
24.	*Memorandum of Understanding and Action Plan Concerning Conservation Measures for the Aquatic Warbler*	*Kyiv, 2003, signed by Minecoresources*
25.	*Framework Convention on the Protection and Sustainable Development of the Carpathians (Carpathian Convention)*	*Kyiv, 2003, to be ratified*