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Nature Reserve

Tutorial

for training students in the speciality

"101 Ecology"

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The study guide contains theoretical material for mastering the normative course of the discipline "Nature Reserve" for students of the specialty 101 "Ecology" of the Bachelor's degree, which will help future environmental specialists to acquire the necessary minimum knowledge of the ecopolitical, theoretical and practical foundations, regulatory, legal, scientific and institutional support of nature reserve management and the formation of their skills in the protection and management of objects and territories of the nature reserve fund, their creation and expansion.
For students, graduate students, teachers and researchers of ecological, biological and agricultural universities specializing in ecology and environmental protection.

В навчальному посібнику викладено теоретичний матеріал для засвоєння нормативного курсу дисципліни «Заповідна справа» для студентів спеціальності 101 “Екологія” освітнього ступеня «Бакалавр», що сприятиме засвоєнню майбутніми фахівцями-екологами необхідного мінімуму знань про екополітичні, теоретичні та практичні основи, нормативно-правове, наукове й інституційне забезпечення заповідної справи та формування в них навиків із охорони і управління об’єктами та територіями природно-заповідного фонду, їх створення та розширення.

Для студентів, аспірантів, викладачів та наукових співробітників екологічних, біологічних та аграрних вузів, які спеціалізуються в галузі екології та охорони навколишнього середовища.

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LIST OF ABBREVIATIONS

NR in Ukraine – Nature Reserve Management in Ukraine

AIC of Ukraine – agro-industrial complex of Ukraine

UN – United Nations Organization

EMA – environmental management and audit system

IUCN – International Union for Conservation of Nature

IUCN – International Union for Conservation of Nature Red List

VU, EN, CR – categories of "threatened" in the international biodiversity list

NBSR – National Biodiversity Strategy

NRF – nature reserve fund of Ukraine

NNP – national nature park

RLP – regional landscape park

UkrBIN (Ukrainian Biodiversity Information Network) – the only open network for the accumulation and exchange of data on biodiversity in Ukraine

EASIN (European Alien Species Information Network) – European Alien Species Information Network

GBIF – Global Biodiversity Information Platform for Ukraine

EU – European Union

FSC – Forest Stewardship Council

Remote sensing – remote sensing of the earth

GREENPIS ("Green World") – International Environmental Organization

WMO – World Meteorological Organization

UNESCO – The United Nations Organization for Education, Science and Culture (1946)

CONTENTS

PRACTICAL PART OF THE DISCIPLINE

PREFACE

Nature conservation is one of the most important components of environmental sciences and environmental protection activities. It plays an important role in the development of theoretical foundations and practical solutions to the problems of conserving biological and landscape diversity, maintaining ecological balance in nature, and shaping the worldview of individuals, communities, and society. The special environmental, social and economic importance of nature conservation was emphasized by the decisions of the UN conferences in Rio de Janeiro (1992) and Johannesburg (2002), where its development was defined as one of the ways to achieve sustainable development.

Studying the basics of nature conservation is important in the training of specialists whose field of activity is related to the protection and rational use of the environment. Relevant knowledge of the scientific principles of nature conservation, its legal framework in Ukraine and the world, organizational, managerial and other fundamentals of nature conservation is necessary for future specialists to competently address the complex issues that they will face in their professional activities. The main purpose of this textbook is to present and analyze the foundations on which the nature reserve system in Ukraine is based, its scientific, legal, organizational, economic, social, and management principles. The materials are presented to the extent defined by the curriculum of the course "Nature Reserve Management in Ukraine".

The methodological recommendations consider nature conservation as an academic discipline that synthesizes theoretical and practical issues of conservation and restoration of natural complexes and their components in the territories and objects of the nature reserve fund. Accordingly, it is important to study this discipline not only to master the theoretical material, but also to know the mechanism of its application. A proper place is given to the analysis of practical issues of organization of protected areas of various categories, ensuring their

protection regime, methods and practice of conducting scientific, recreational, educational and other activities within the nature reserve fund of Ukraine.

The bibliography of nature reserve management includes thousands of articles and hundreds of monographic publications, and its volume is increasing every year. This is a testament to the social significance of nature conservation and the growing awareness of the role of protected areas.

These guidelines are based on an analysis of scientific, regulatory, legal, and statistical sources and a generalization of the authors' own research and practical experience. The authors consider it necessary to include general issues of theory, methodology and practice of protected area management in Ukraine. These issues are considered in the context of international experience and current trends in the development of nature reserves in the world.

SECTION 1. STAGES OF THE HISTORICAL DEVELOPMENT OF NATURE RESERVES. ISSUES OF CREATION, EXPANSION AND PROTECTION OF THE NATURE RESERVE FUND IN THE ENVIRONMENTAL POLICY OF UKRAINE

Outline

1.1. The role and importance of protected areas and objects in the life of the biosphere and society.

1.2. The content, definition and objects of the protected area.

1.3. Historical milestones of the reserve management in Ukraine.

1.1 The role and importance of protected areas and objects in the life of the biosphere and society

Everyone who visits our Ukrainian land is struck by its unique beauty, picturesque landscapes, emerald forests, and diversity of fauna and flora. And most importantly, Ukraine's natural conditions, fertility of its land, and richness of its subsoil contribute to the development of the agricultural and industrial sectors of the economy. Therefore, the problem of rational use of natural resources, preservation of our country's environment, its unique territories and objects is of great practical importance.

One of the most effective forms of protection of valuable natural objects and territories is their reservation – placement under state protection. The creation of protected areas is necessary to preserve valuable species of flora and fauna, unique landscapes, geological and paleontological sites, etc. At the same time, the rational, sustainable use of natural resources is impossible without the existence and study of its permanent standards of protected areas and territories. This makes it possible to identify the changes that humans make to the environment, to compare pristine nature with a cultivated landscape, and, ultimately, to develop a strategy for environmentally balanced natural resource management. In other words, the protection of territories and natural objects through their conservation is aimed not only at preserving them in an intact state. The tasks are much broader and more responsible – scientific, recreational, environmental, educational and upbringing.

Focusing on the role and significance of protected areas and objects in the life of the biosphere and society, seven main aspects should be highlighted in this regard. First of all, all protected areas and objects are the basis of the ecological network of both regions and Ukraine as a whole, which ensures their ecological balance. The ecological network includes nature reserves, which are its core, protected areas such as forests of the first group, green areas of cities, as well as natural vegetation used by humans, such as regulated and exploited forests, meadows, pastures, etc.

The idea of an ecological network is one of the most fundamental ideas of recent decades in the field of theoretical and applied ecology.

It is a kind of reaction to the consequences caused by the chaotic and consumerist development of society, an attempt to at least partially compensate for losses in the natural environment. Its essence is to create a network of interconnected areas of natural territories. The network includes "ecological cores" (protected areas), "living ecological corridors" – valuable natural areas that connect the cores, and "buffer zones" – areas that protect the eco-cores and eco-corridors from external impacts. The creation of an ecological network makes it possible to ensure the conservation of biodiversity and ecosystems in general, as well as coenotic fullness, population components, and the preservation of the gene pool of valuable representatives of fauna and flora in particular. This ensures regional conservation of biodiversity and supports the framework of "ecological corridors" on the European scale. The creation of the Ukrainian ecological network is a key element of the practical implementation of the ecological system of nature management. The ecological network is based on forest, forest-steppe, and steppe areas, valleys of rivers of the first magnitude, and certain azonal and indigenous natural formations, including centers of endemism (Carpathians, Crimea, Podillia) and relics. The list of such natural formations includes forests, peatlands, steppe and forest-steppe massifs, and individual natural complexes, i.e. all those territories with landscape and natural features. Of great importance in the formation of Ukraine's ecological network is its transboundary context, where the environmental interests of neighboring states, international importance and impact on the life of the biosphere as a whole are

decisive. For example, beech virgin forests on the border with Romania, Poland, and Slovakia, marshlands of the Pripyat Valley on the border with Belarus, forests with Russia, steppe forests on the border with Moldova, and the valleys of the Dniester, Danube, Dnipro, Prut, Syan, Western Bug and Siverskyi Donets ensure the continuity of eco-corridors and the integrity of complexes on a European scale.

Protected areas and sites also serve as a gene bank for flora and fauna. Sustainable use of the biosphere in the future depends on preserving the entire genetic diversity of the planet, as well as its individual regions, for future generations, and ensuring conditions for the evolutionary development of species. Protected areas play a special role in solving this problem because they are created primarily in areas characterized by the richness of flora and fauna and their diversity. According to international and domestic practice, the following are important for selecting the territory of nature reserves: optimal habitat or habitat for one or more endangered species; areas with maximum diversity of fauna and flora; areas with maximum endemicity; areas where biodiversity is preserved as long as possible.

The need to preserve all species of animals and plants that exist on the planet, i.e. to preserve the gene pool that has arisen in the course of the multi-million-year evolution of the organic world, is beyond doubt today. After all, intensive human economic activity leads to a great burden on the natural environment. Under the influence of anthropogenic factors, landscapes are changing, flora and fauna are being depleted. In this regard, the question may arise: is it possible to preserve all the diversity of wildlife in the future? There can be only one answer to this - it is necessary to preserve and can be preserved, and the main role in this is assigned, first of all, to the further development of nature conservation, expansion of the network of natural protected areas under special state protection.

For example, various types of nature reserves not only preserve rare, endangered, or scarce species of plants and animals. They also preserve the natural gene pool of plants and animals, which is a treasure trove of nature. Past and present generations have bred domestic animals and cultivated plants from wild animals and plants. Who today can predict what needs humanity will have in the future? What

species of animals and plants will be included in the economic cycle? Therefore, it is our duty to preserve not only rare species, but all species of plants, animals, and microorganisms for posterity.

Reasonable human activity in the field of environmental protection has averted the threat of extinction of many representatives of fauna and flora in different parts of our planet. For example, it is known that the joint efforts of a number of countries have saved the European bison from extinction. The European bison ceased to exist in the wild, but it was reproduced in zoos. Today, the total number of these animals, which are distributed in various protected areas, exceeds two thousand individuals. In particular, there are 168 of them in the Zubrovytsia Nature Reserve in Chernivtsi Oblast alone, 48 in the Skole Beskydy National Nature Park, and so on.

In general, in cases where the number of any animal species decreases to catastrophic proportions, measures are taken to protect and reproduce them in the wild, as well as to ensure their survival and reproduction in captivity with subsequent reacclimatization in their former habitats. For example, in the twentieth century, the European beaver, white rhinoceros, Bengal tiger, Przewalski's horse, etc. were preserved as species.

For almost hundreds of years, various species of plants have been successfully reproduced and propagated in botanical gardens in many countries. The Central Botanical Garden of the National Academy of Sciences of Ukraine was one of the first in Ukraine to start and successfully carry out work on the reproduction of species that have almost disappeared in nature. Over the past decades, its scientists have transferred a number of valuable plants into culture and then distributed them in their natural habitats. An example is the restoration by sowing seeds collected from plants cultivated in the botanical garden: the Southern Bug broom on granites along the banks of the Southern Bug River, woolly-flowered astragalus on the left bank of the Kyiv region, etc. Therefore, the task of botanical gardens is to study in depth the biology of various species of rare, endangered, endemic, relict, and useful wild plants; to develop effective methods of their reproduction, and to determine

optimal conservation regimes for them. For this purpose, in addition to natural undisturbed areas, specially created breeding grounds can be used, as well as artificial plant communities with the participation of these species, modeled after natural ones or arranged according to the targeted plan of scientists.

Botanical gardens care not only about preserving the gene pool of cultivated plants, enriching their range through acclimatization and breeding new varieties, but also about preserving the unique gene pool of local natural flora, which is especially true for the Botanical Garden of Chernivtsi National University.

The country's zoological parks play a similar role, with the task of comprehensively studying the biology of wild animals, collecting and preserving endangered species.

The vegetation of protected areas is a benchmark in a number of respects, including the structure of biogroups, floristic composition, and productivity in specific environmental conditions. Therefore, it is necessary to preserve areas with the maximum diversity of environmental conditions and flora and fauna species. This significantly increases the ecological role of protected areas. After all, each species, being unique, has scientific value both now and in the future. And now it is impossible to determine the direction of their future use by humans and in the national economy.

A testing ground for scientific monitoring of the environment is an important role of the nature reserve fund's territories. They make it possible to analyze and predict changes in the environment. Changes in nature are of a dual nature: some are caused by natural factors that do not depend on humans, occurred before they appeared on Earth and are still happening today; others- man-made - are a direct result of human activity. With the development of science and technology, they are becoming more and more noticeable, turning into a global force. Therefore, the impact of anthropogenic and natural factors on ecosystems is studied in the protected areas of our country, and special studies are conducted in accordance with the environmental monitoring program, which aims to:

♦ observation of the variability of the natural environment with a focus on changes caused by anthropogenic factors

♦ assessment of the state of the environment and anthropogenic factors affecting it

♦ forecasting changes in the state of the environment under the influence of human economic activity.

In the network of protected areas, biosphere reserves are the most effective in fulfilling these functions. The Biosphere Reserve Development Program has provided opportunities for international cooperation in three important areas: 1) conservation of biological diversity, 2) organization of a system for collecting basic biological data, and 3) integration of human impact on biological systems. Experience confirms that monitoring in biosphere reserves will enable humans to improve biosphere management, and its results will be widely used in various areas of human activity. After all, the modern understanding of the concept of a biosphere reserve includes, as components, elements of ecosystem protection, a reference for comparison and the ability to observe such methods of land use that identify the best combinations of these components in the interests of society and the environment.

The task of scientific monitoring carried out in protected areas is to develop methods of accounting, reproduction and rational use of plant and animal resources in the economic sector of different geographical areas; measures to protect and restore the number of rare and endangered species of fauna and flora; measures aimed at preserving natural complexes in protected areas; biological methods of controlling harmful animals and plants; determining the effectiveness and consequences of the use of natural.

The development of recreational activities and the creation of favorable environmental conditions for human health are inextricably linked to the development of nature conservation. After all, recreational resources and resort areas are an integral part of national natural parks, regional landscape parks, and parks that are monuments of landscape art. It has been proven that, for example, the value of ecological and recreational functions of forests, as well as the growth rate of the

importance of these functions, is much higher than their raw materials. It is indisputable that protected areas have significant benefits directly or indirectly for the local and national economies, form a balanced resource conservation, and contribute to the improvement of the environment and human health. This can be seen in the functioning of health facilities, such as recreational resources and resort areas of sanatoriums, resorts, recreation centers, boarding houses and camps, as well as separate nature protection and recreational areas. The main positive factors of protected areas that contribute to human health protection include:

♦ air purification, absorption of pollutants, ensuring the purity and fullness of water resources;

♦ organization of healthcare facilities on the territory of the nature reserve fund and buffer zone aimed at physical rehabilitation of the population

♦ use of certain wildlife products used in local diets and alternative medicine, preservation of the genetic bank for new and known medicines;

Recreation in unspoiled nature, observation of natural objects enrich and beautify human life, relieve stress, and increase efficiency in work;

♦ the ability to integrate nature conservation projects of protected areas with projects of balanced rural and agricultural development, which will result in high-quality agricultural production and production of environmentally friendly products.

The nature reserve fund is the basis for environmental education.

The implementation of environmental education and environmental protection education, as well as the preservation of the gene pool, standards of natural ecosystems and the maintenance of ecological balance, are among the main tasks of protected areas and objects. The main objectives of environmental education are:

♦ to explain the uniqueness and importance of the territories and objects of the nature reserve fund for their conservation and support in the regions and the country

♦ to inform the public about the actual environmental situation in the territories and objects of the nature reserve fund;

♦ to form a favorable attitude of the population to the nature reserve business.

Thus, the role of the nature reserve fund in the life of the biosphere and society is extremely important and multifaceted. Therefore, it is necessary to carry out constant work on its protection and expansion.

1.2 The content, definition and objects of the protected area

The content and definition of the protected area. "Conservation" is a widely used and generally accepted term. However, there is no consensus among professionals involved in this field on the content and scope of this concept. Consequently, no single definition has yet been developed. The main differences in views are that some specialists consider reserve management as a field of practical activity aimed at creating protected areas and ensuring that they fulfill the necessary functions. Of course, this activity has a theoretical basis and is based on certain theoretical and methodological principles. However, according to this "pragmatic" interpretation of protected area management, these principles are considered to be its scientific basis, which is not included in the protected area management itself. Just as commercial business is based on the laws of economics, but they are not directly included in this business, so the conservation case is also based on certain scientific laws, but does not contain, let alone develop them independently.

The basis for this mutual understanding and mutual enrichment of different sciences is a clearly defined goal of nature conservation – to preserve and restore natural complexes or their individual components in specially designated areas. The ways of achieving this goal are different (scientific and practical, economic and environmental, in situ and ex situ, etc.), but their focus on achieving a common goal determines that nature conservation is a holistic area of human activity. It includes both scientific research and practical measures. Thus, ***nature conservation can be defined as the theory and practice of conservation and restoration of natural complexes and their components, as well as their rational use within the territories and objects of the nature reserve fund.***

From the definition of conservation it is clear that it consists of two parts: theoretical (scientific) and practical.

Currently, in scientific terms, nature reserve management is not a separate science or scientific field, but a complex of sciences whose laws, regularities, concepts and other provisions and methods are used to address issues important for nature protection in the territories and objects of the nature reserve fund. It is not nature conservation itself that seeks and formulates new scientific laws or concepts; it only uses the scientific provisions of other sciences. In addition, by setting tasks for these sciences that are necessary for the development of nature conservation, it stimulates them to look for new patterns, develop new research methods, etc. Thus, the "science" of nature conservation is not only in the fact that it has a strong scientific basis, but also in the fact that it encourages the development of new scientific fields. In biology, for example, such a direction is called "conservation biology".

The second component of the protected area management, referred to in the above definition as "practice," is no less extensive than its theoretical part. Although some experts complain that the term "conservation" is not entirely appropriate, we believe that it clearly indicates that environmental protection is a practice, not just knowledge, theory, or a call to action. Within the framework of conservation, theory is closely intertwined with concrete actions. They are diverse (from the preparation of legislative documents to the protection of a particular population directly at the place of its growth), carried out at different management levels (from national to local), take different time (from long-term planning to urgent actions), but in their totality they constitute an integral complex. This complex is complex and multilevel. It does not exist autonomously from other areas of social activity (e.g., territorial planning, recreation and leisure development, etc.), but has close ties with them. Ideally, it should be organically integrated into the overall structure of the national economic complex both at the level of the state and its individual regions.

In Ukraine, nature conservation as an independent academic discipline was recognized de facto and de jure with the introduction of a course of the same name into the curricula of leading higher education institutions. Its purpose is to provide

students with the basics of knowledge in nature conservation, including its scientific, legal, organizational, managerial and other foundations.

The first structural part of the reserve case, which can be conditionally called "essential", deals with the problem of the very essence of the reserve case, its interpretation, definition, objects, etc.

The scientific foundations of the reserve case constitute its second part. It should be emphasized that the numbering of these and other parts of the reserve management is in no way related to the ranking of the relevant subsections by their importance, weight, or priority, but only reflects the logic and sequence of their presentation within the course. The scientific foundations of reserve management, in turn, can be conditionally divided into two parts: 1 – scientific foundations of the reserve management itself, and 2 – scientific research within the territories and objects of the NRF, among which the scientific support of the Chronicle of Nature is of particular importance.

The organizational and legal framework of reserve management is its third major part. It covers such groups of issues as the legislative framework of protected areas, the legal regime of protected areas and objects, and the categories of protected areas in Ukraine and the world. An important component of this part is the consideration of the principles on which international cooperation in the field of protected areas is based.

The knowledge of the scientific foundations and organizational and legal framework of nature conservation allows us to consider its next part, namely **the creation and design of protected areas**. In this area of nature conservation, three groups of issues can be distinguished, the scientific basis and legal framework of which has certain peculiarities. These issues are as follows: 1 – creation of protected areas of Ukraine, 2 – creation of transboundary protected areas, 3 – development of the national ecological network of Ukraine on the basis of protected areas.

After the creation of protected areas, relevant activities are carried out in them. Therefore, the next part of the study of protected areas is a group of issues related to environmental **protection activities in the territories and objects of protected**

areas. This part covers such diverse issues as protection regimes, the procedure for the use and control of protected areas, recreational, scientific, educational and other activities within protected areas.

Finally, considering protected area management as an academic discipline, its important component should also include knowledge about the protected areas owned by the nation. Thus, **the structure and zonal and regional features of the nature reserve fund of Ukraine** are considered as an important part of the reserve management.

1.3 Historical milestones of the reserve management in Ukraine

Natural protected areas have existed at all times and among all peoples. With the emergence of religions, they were dedicated to gods and had sacred significance. The Eastern Slavs "settled" their gods on the tops of mountains (Beskydy, Lysa Mountain in Kyiv), caves, and groves – places that were quiet, wild, and far from housing. Natural objects of extraordinary beauty, such as healing springs, waterfalls, individual stones, and rocks, were protected by gods and folk traditions. Many places became sacred because of the myths associated with them. For example, the Greeks who lived on the coasts of the Azov and Black Seas considered the islands of Tendra and Dzharylgach sacred. They dedicated the island of Tendra to Achilles, and it was called Achilles' heath. Temples were built on the island and a statue of the hero was erected. Some natural objects were bequeathed as sacred in connection with historical events. For example, the burial places of noble ancestors were of sacred significance.

During the times of Kievan Rus, groves, lakes, rivers, and keys were bequeathed as sacred and were ruled as temples: gaibog, bozhnytsia, sviatibor, and Bug. There were also "reserved groves" located near settlements, mostly on elevated ground. In Kyiv, the Shuliavskyi (Kadetskyi) grove on the banks of the Lybid River was considered sacred. It was cut down during the Civil War. Now only one 400-year-old oak tree remains of this grove. In the sacred oak groves, the oldest trees were fenced off, and only priests could enter. Some Slavs called sacred groves

paradise. Professor E. Anichkov believed that many years ago a sacred grove, the abode of the Kyivan gods, rustled with leaves on the site where the Kyiv Cave Monastery is now located.

Forests of monasteries that were closely guarded can also be considered proto-reserves. For example, near the Okhtyrka Monastery there is a forest on the Vorskla River, and near the Sviatohirsk Monastery there is a tract of chalk pine. The forest tract of Kitayevo, Holosiivskyi forest, and Koncha Zaspa near Kyiv have also been preserved thanks to the monks. Later, in 1921, the Koncha Zaspa tract became a nature reserve, and the Holy Mountains became a national park in 1997. Another type of proto-reserve was the clear-cut forests near the southern and southeastern borders of Muscovy, in the Dnipro and Don rivers, in the territory of the modern Kharkiv and Belgorod regions. These forests were strictly protected. To protect them, the tsars issued special decrees. The system of clear-cut forests existed until the end of the seventeenth century. Some modern nature reserves were created on the site of former clear-cut forests.

Thus, in ancient times, natural objects were protected as sacred in connection with myths, for moral, political, and historical reasons. In addition, those territories that were especially "pleasing" to the gods due to their special natural properties became protected sacred places.

In the princely era, communities had their own hunting grounds, which they protected. There were agreements between the princes of Kievan Rus and between individual communities on hunting grounds and methods of hunting. Those who violated them were severely punished. For example, it is known that in 970 Prince Oleg killed the son of the voivode Sveneld, having met him in a place forbidden for hunting. Of course, the first Russian legal documents regulate the use of lands or certain species not for conservation purposes, but from the standpoint of ownership. "Grand Duke Yaroslav Volodymyrovych's "Statute of the Courts" had a separate section on beavers and defined the punishment for unauthorized hunting of this animal. According to Ruska Pravda, a fine of 3 hryvnias was imposed for taking a hawk or falcon from someone else's property without permission, and 12 hryvnias

for a beaver from a hole. If traces of illegal fishing were found in someone else's property, such as nets or dug up earth, the community had to extradite the thief or pay a 12-hryvnia fine.

Kyivan princes began to create protected areas for utilitarian purposes. Thus, at the end of the 11th century, Volodymyr Monomakh had several tracts near Kyiv that were protected for princely hunting: Sokolynyi Rih and Zvirynets. The Bortnytsia lands were also protected. In the 12th century, Volodymyr Volynskyi protected the Bialowieza Forest, which became the first officially documented nature reserve, in order to protect bison.

The very first nature reserve in Ukraine, in the close to modern sense of the word, was organized in the late 19th century by Count Volodymyr Dzedushytskyi, a patron of science, ornithologist, and great lover of nature. The Penyatska Monument Reserve was created for scientific and aesthetic purposes in a beech forest on an area of 20 hectares near the village of Penyaki near Brody. Unfortunately, the forest was largely cut down during the troubles of the World Wars. The protected status of the Penyatska Monument was restored in February 1997.

The most famous ancient nature reserve in Ukraine is, of course, Askania-Nova, created by F.E. Falz-Fein. As early as 1883, he fenced off 8 acres of **Askania-Nova** land where he kept steppe animals. Friedrich Faltz-Fein began to protect the first plot of virgin land in the area of the Kroli tract after graduating from the university in 1889. This date can be considered the beginning of the creation of the first reserve in the Russian Empire. Initially, when his father's estate was divided, Friedrich got the Dorenburg estate, and his brother Volodymyr got Askania. However, seeing Friedrich's disappointment with this division of the inheritance, his brother exchanged estates with him.

In 1893, Kyiv fish breeder I.N. Faleev established the Kyiv branch of the Russian Society of Fisheries and Fisheries, and in the same year he succeeded in getting the Society to protect a well-known spawning ground, Lake Koncha near Kyiv. This site became the fourth protected area on the territory of modern Ukraine.

In 1895, I.N. Faleev published his study "Dnipro Fishing" in three issues of the Fisheries Industry Bulletin, in which he first raised the issue of creating fish reserves in Ukraine: "In my opinion, such places, if chosen well, would give a huge increase in fishery resources. The vines and, in general, the vegetation surrounding the protected lakes or bays should be untouched".

The following local nature reserves were liquidated in Ukraine: Golden Stream, Gomilshansky Forest, Chernechyna, Bilosaray Spit, White Mountain, Shutromyntsi, Galilee, Hawthorns, Vengilsky Forest, Kostopilsky, Artem's Mountains, Yew Forest, Velyko-Burlutsky, Stone Graves, and five republican ones: Horiste, Veseli Bokovenky, Ustynivka, Trostianets, and Seredniodniprovskyi (Kanivskyi). 1,000 hectares were taken away from the Black Sea Reserve for the needs of collective farms, and 200 hectares from the Azov-Sivash Reserve. In total, 33 thousand hectares of protected land remained in Ukraine, i.e. 60% of the former area.

Unfortunately, the significant reduction of the reserve network that took place in 1951 continued. As a result, by 1965, there were only 2 reserves in Ukraine with a total area of 11536 hectares. At that time, the reserve system in the Ukrainian SSR had the worst performance during the entire period of Soviet rule. The share of the territory under reserves was only 0.02%.

The Law of Ukraine "On Environmental Protection" (1991) is the same age as our country's independence. It became the basis for the development of a series of legislative acts in the field of environmental law. In 1992, the Law of Ukraine "On the Nature Reserve Fund of Ukraine" was adopted, which defined the modern classification of territories and objects of the nature reserve fund, regulated property issues, and the basic requirements for the regime of protection, use and management of protected areas. In the same year, the Regulation on the Red Data Book of Ukraine was approved, which defines the legal status of rare and endangered species. The creation of protected areas is defined as one of the measures for the protection and reproduction of "Red Book" species. 126 rare plant communities were included in the Green Book of Ukraine, which became a legal act in 1999. The Regulation on

the Green Book of Ukraine provides a legal basis for developing measures to preserve rare coenoses. The development of Ukraine's environmental legislation is based on the basic law – the Constitution of Ukraine, which states the need for nature conservation by both the state (Article 16) and citizens (Article 66). Thus, Ukraine has a fairly good legislative framework for the development of nature conservation.

The specially authorized body of state administration in the field of organization, protection and use of the nature reserve fund is the central executive body in the field of environmental protection, which creates a special unit for operational work. On March 14, 2001, the Cabinet of Ministers of Ukraine issued Resolution No. 239 establishing a governmental body, the State Nature Reserve Service, under the Ministry of Ecology and Natural Resources of Ukraine (now the Ministry of Environmental Protection of Ukraine). This governmental body was created on the basis of the Main Department of National Parks and Nature Reserves of the Ministry of Environmental Protection and Nuclear Safety of Ukraine, which began its activities in 1995.

The nature reserve fund of Ukraine is developing dynamically. *Since 1992, it has almost doubled in size and includes 7,010 territories and objects with a total area of 2,557.8 thousand hectares, which is 4.2% of Ukraine's territory.* The development of the nature reserve fund of Ukraine was the result of the implementation of the Program for the Prospective Development of Nature Reserves in Ukraine "Reserves", approved by the Verkhovna Rada of Ukraine on September 22, 1994. The program defined the strategy for the development of nature reserves in Ukraine until 2005, laid the foundations for the scientific, organizational, material and technical development of nature reserves and optimization of the network of territories and objects of the nature reserve fund.

Since gaining independence, Ukraine has become an active participant in international environmental protection activities. At the World Conference of Heads of State in Rio de Janeiro (1992), with the participation of the Chairman of the Verkhovna Rada of Ukraine, documents crucial for the further development of the world's countries were adopted: Agenda 21 and the Convention on Biological

Diversity. The international community set a course to achieve the principles of sustainable development under the main condition of biodiversity conservation. In 1995, in Seville (Spain), UNESCO made adjustments to the formation of the World Network of Biosphere Reserves, which was launched by the UNESCO Man and the Biosphere Program in 1974. The adopted Seville Strategy for the Development of Biosphere Reserves, along with such functions of biosphere reserves as conservation of biological diversity and monitoring of ecosystems, set the function of achieving sustainable (socio-economic) development of the territory. The UNESCO decision granted Ukraine the status of biosphere reserves: Black Sea, Askania-Nova and Carpathian Biosphere Reserves, the Danube Biosphere Reserve as part of the Ukrainian-Romanian Danube Delta Biosphere Reserve, the Uzhansky National Nature Park with the Nadsyansky Regional Landscape Park as part of the Ukrainian-Polish-Slovak Eastern Carpathians Biosphere Reserve, and the Shatsky National Nature Park.

Ukraine is an active participant in the implementation of the European Strategy for the Conservation of Biological and Landscape Diversity, which was approved at the Conference of European Environment Ministers in 1995 in Sofia. The priority area of this strategy is the development of an ecological network as a system for protecting the natural heritage of the European community. This system will ensure, firstly, the creation of a single, integrated system for the preservation, reproduction and improvement of national natural resources throughout the continent and, secondly, the combination of efforts at the national and international levels. In the fall of 2000, the Verkhovna Rada of Ukraine approved the National Program for the Formation of the National Ecological Network of Ukraine for 2000–2015. The goal of the program is to increase the area of the country's lands with natural landscapes to a level sufficient to preserve their diversity and form a territorially unified system that would ensure the conservation of natural ecosystems, flora and fauna. The National Ecological Network should be integrated into the Pan-European Ecological Network and perform functions related to the conservation of

biological diversity. The program envisages almost doubling the percentage of protected areas and objects of the nature reserve fund of Ukraine by 2015.

Questions and tasks for independent work

1. What is the most effective form of protection of valuable natural areas and objects?
2. What are the main aspects of the role and importance of the nature reserve fund in the life of the biosphere and society?
3. What is the basis for creating an ecological network?
4. What is the core of the ecological network?
5. What are the criteria for selecting a territory for the organization of nature reserves?
6. Is it possible to preserve all the diversity of wildlife?
7. What species of animals have been preserved by the method of reacclimatization?
8. What are the tasks of botanical gardens in the field of reproduction and propagation of rare and endangered species of flora?
9. Describe the role of the nature reserve fund in the preservation of rare, typical and picturesque landscapes.
10. Why should geological and karst-speleological natural sites be preserved?

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SECTION 2. CONVENTION ON BIOLOGICAL DIVERSITY, INTERNATIONAL LEGAL DOCUMENTS - STUDYING INTERNATIONAL AND UKRAINIAN EXPERIENCE IN THE FIELD OF NATURE PROTECTION

Outline

2.1. Nature protection in the context of international environmental cooperation.

2.2. International Union for Conservation of Nature and the Nature Reserve Fund of Ukraine.

2.1 Nature protection in the context of international environmental cooperation

The development of international cooperation in the context of the world environmental movement, regardless of national, socio-economic, state and political features, traditions, as well as the peculiarity of natural conditions of different countries, has certain trends and directions. After all, the problems faced by most countries were very similar: criteria for determining species of flora and fauna subject to special protection, the state of the environment, the need to take special measures to protect valuable natural areas, unification of special terminology, improved information, etc. Therefore, since the 1960s, a number of documents have been adopted over the past two decades that have formed the relevant international legal framework and created conditions for solving many problems of biodiversity conservation and protected areas at the global level.

The most important international documents in terms of conservation of biological and landscape diversity are the Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar, 1971), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, DC, Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, DC, 1973), Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979), Convention on the Protection of Wild Flora and Fauna and Natural Habitats in Europe (Bern, 1979), and Convention on Biological Diversity (Rio de Janeiro, 1992).

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar, Iran, February 2, 1971) consists of 12 articles. The Convention recognizes not only the interdependence of humans and the environment, but also that wetlands are regulators of the water regime, support the existence of characteristic fauna and flora, and are of great scientific, recreational and cultural importance. This clarifies the concept of a wetland - as a rule, these are areas of marshes, bogs, peatlands – and they can be both natural and artificial, permanent or temporary, standing or flowing. These lands also include marine areas whose depth at low tide does not exceed 6 meters. As for the individual Member States of the Ramsar Convention, they, as stated in the relevant article, carry out their planning in such a way as to contribute to the protection of wetlands, and also undertake to use these areas rationally. Each of the Parties shall identify the relevant wetlands and ensure their conservation. States are given the right to both expand the list of such sites and reduce it, taking into account national needs. At the same time, research, data and information exchange, and training are encouraged. During the twenty years of Ukraine's participation in this convention, the area of wetlands in our country has almost doubled and now exceeds 460 thousand hectares.

In March 1973, the Convention on International Trade in Endangered Species of Wild Fauna and Flora was signed in Washington, DC. The 25 articles of the Convention set out the basic principles and provisions of such trade, including with states that have not acceded to the Convention. The Convention includes three appendices, in particular, the first one lists endangered species (regulated as strictly as possible), the second one lists species that are not necessarily endangered at present, but require strict regulation to avoid possible negative consequences, and the third one lists species that any party to the Convention determines should be subject to regulation.

The adoption of this Convention was prompted by the huge volumes of illegal trade in valuable animals and plants taken from the wild, which threatens their survival. According to international experts, the volume of global trade in wild fauna and flora species, excluding trade in timber and fish products, reaches $5 billion a

year. Every year, about 30,000 monkeys, two million wild orchids, five million birds, ten million snake, rattlesnake and crocodile skins, and fifty million bulbs of valuable wild plants are illegally sold.

In order to combat poaching and trade in the most vulnerable natural resources, the Convention establishes a unified procedure for the export and import of live plants and animals, as well as their parts, products and derivatives. The Convention provides for the prohibition or strict control of international trade or other movements across the customs borders of 14,000 species of wild fauna and flora. Trade in these species is permitted subject to the authorization of a specially designated administrative body and confirmation of the legality of the acquisition of these species.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora aims to provide special regulation on these issues. A differentiated approach is envisaged depending on the level of rarity of the species in question. It defines the conditions and procedure for issuing permits for the export of plant and animal specimens, their import, re-export and introduction from the sea, i.e. the waters not under the jurisdiction of a particular state. To ensure compliance with the requirements of the Convention, its Parties are obliged to introduce liability for illegal trade and possession of relevant plant and animal specimens and provide for the possibility of their confiscation. Each country participating in the Convention determines the administrative body that will issue permits and specialized scientific centers.

The Convention on the Conservation of Migratory Species of Wild Animals was signed in Bonn (Germany) on June 23, 1979 and stipulates that in order to prevent the occurrence of unfavorable conditions for migratory species, appropriate measures should be taken both by individual countries and through their cooperation. The provisions of the Convention emphasize the importance of adequate support for scientific research on these issues. A list of migratory species that are particularly endangered is defined. States Parties must take immediate measures to protect some species, and with regard to others, they must endeavor to

conclude appropriate agreements that would ensure the protection of such species and effective management of these issues. The Convention provides for the protection of areas, restoration measures, where possible, and prevention or minimization of the negative impact of any activity on the living conditions of migratory species. Their removal from the natural environment is prohibited. Exceptions are possible only for the needs of science, artificial breeding or in case of a significant decrease in the number of species, the inability of the species to survive on its own in the natural environment. The Convention provides for the introduction of certain procedures for cooperation in case of emergencies, exchange of information, and broad public involvement in these activities.

The need to adopt this Convention was based on the recognition of migratory species of wild animals as an important part of the world's biological diversity and the belief that any form of use of these animals should be carried out with due regard for the conservation status of certain species throughout their range, taking into account their biological properties.

The Convention on the Conservation of Wild Flora and Fauna and Natural Habitats in Europe, adopted under the auspices of the Council of Europe on September 19, 1979 in Bern (Switzerland), made a significant contribution to the development of nature reserves. The main prerequisite for the adoption of the Convention was that wild fauna and flora, together with their habitats, are the natural heritage of Europeans, their cultural, historical, economic and other assets. The Contracting Parties undertook to include nature conservation measures in their national environmental plans and state development priorities. The main tasks of the participating countries in the field of environmental protection are as follows:

♦ establishing an appropriate level of protection for all species of wild flora and fauna;

♦ strengthening the protection of endangered species

♦ taking measures to preserve the habitats of species of wild flora and fauna, especially those that are endangered;

♦ promoting international cooperation of participants in the field of environmental protection.

The Convention includes 34 articles that regulate the procedure and implementation of these tasks and 4 annexes. The first two are lists of endangered species of wild flora and fauna, the

The third includes species whose use is regulated, and the fourth lists prohibited means of taking birds, mammals and fish. The list of endangered plants includes 534 species, and 487 species of animals, including 388 vertebrate species and 101 invertebrate species.

The Convention on the Protection of Wild Flora and Fauna and Natural Habitats in Europe pays special attention to those species and areas whose conservation requires cooperation of several states and international assistance. Each Member State shall take measures to develop national policies for the conservation of wild fauna and flora, paying particular attention to endangered and vulnerable species, especially endemic and threatened species. The requirements for the conservation of wild fauna and flora should be taken into account in planning policies, prevention of degradation of particularly valuable areas, and the fight against environmental pollution. The Convention allows member states to make certain reservations regarding the harvesting of listed species, the area of application of the Convention, and the possibility of using certain prohibited means of harvesting.

Adoption of the Convention on Biological Diversity (Rio de Janeiro, June 5, 1992) is a significant step of the international community in the field of nature conservation. The scope of the Convention covers the entire planet, and almost all countries of the world are its parties. The provisions of the Convention relate to the rights and obligations of countries with respect to biological genetic resources located in their territories, the possibilities of access to them by other states, and the role of international cooperation in ensuring their reliable conservation and sustainable use. The Convention formulates a compromise provision that recognizes the sovereignty of states over their natural resources and, at the same time, imposes

on states the responsibility for the conservation and sustainable use of biodiversity. All countries, based on their sovereignty, have the appropriate authority to determine the conditions of access to resources under their jurisdiction or control. At the same time, states should make efforts to create the necessary conditions for access to their genetic resources by other Parties to the Convention. It is also stipulated that countries, opening access to their natural resources to other countries, in turn, should have greater access to modern technologies possessed by economically developed countries.

Economically developed countries should provide financial resources that would allow developing countries to compensate for the additional costs associated with the implementation of the Convention. It should be noted that for countries in transition to a market economy, participation in the relevant costs is voluntary, while for economically developed countries it is mandatory. The Convention recognizes that developing countries will be able to effectively fulfill their responsibilities only to the extent that economically developed countries provide them with support.

It should be emphasized that the Convention on Biological Diversity was signed as a result of the UN Conference on Environment and Development (Rio de Janeiro, 1992). This important document was the result of the so-called Earth Summit, which took place at the final stage of this UN conference. It should be noted that 179 states were represented at the Conference, and 114 presidents, vice-presidents and prime ministers participated in its work. That is why the Conference reflected the environmental problems of the whole world. The main threat to the future of the Earth, as emphasized in the Convention, is climate change - especially the so-called greenhouse effect, which causes sea level rise and flooding of coastal regions, and the emergence of devastating hurricanes. In addition, climate change also causes aridity in some regions of the world and deforestation.

A significant contribution to the development of nature reserves in Europe is made at the conferences of environmental ministers within the framework of the Environment for Europe process, where important issues of the current state of the environment are discussed.

For example, in October 1995, in Sofia (Bulgaria), the ministers of environment of 55 countries adopted the Pan-European Strategy for the Conservation of Biological and Landscape Diversity and the Sustainability of the Natural Environment. This strategy combines various measures into one integrated approach and combines the conservation of biological and landscape diversity with social and economic processes. The main priorities for environmental protection for the period up to 2015 are balanced and sustainable use of land resources, increasing forest cover, protecting vulnerable ecosystems, expanding the network of nature reserves, promoting environmentally sound agricultural practices and sustainable regional development, preserving biodiversity of marine and coastal ecosystems, and restoring wetlands.

An important achievement of the Fourth Conference of Ministers of the Environment (Aarhus, Denmark, June 23–25, 1998) "On access to information, public participation in decision-making and access to justice in environmental matters". Ukraine was one of the first countries to sign this Convention on July 6, 1999. The Convention provides citizens with the right to live in a favorable environment, the right to information on the state of the environment and on measures that may affect it, and access to justice when it comes to citizens' rights to a favorable environment. Broad access to environmental information increases the responsibility of managers and executives of all ranks when introducing new technologies and substances, constructing facilities that may affect the environment, and improves the quality of environmental assessments and relevant technical documentation. The Convention provides a list of activities that may affect the environment and for which the public has the right to comprehensive information.

The fifth Conference of Ministers of Environment within the framework of the "Environment for Europe" process was held in Kyiv (May 2003). Among the priority issues considered were promoting further development of the pan-European environmental process, changing the guidelines for socio-economic development and environmental balance, strengthening the natural component of the European landscape by reserving valuable natural areas and objects, etc. In particular, a special

agreement was signed on the conservation and prospects for the protection of the Carpathian region within Europe.

An important factor in the further development of international environmental cooperation and domestic law on the conservation of biological and landscape diversity should be the system of legislation of the European Union, especially in view of the accession of new members. There is a growing need for these countries to harmonize regulations on the regime of protected areas, the use of migratory animals, especially with regard to the timing and prohibition of certain forms of their use, permitted rates of extraction, and the procedure for the transboundary movement of biodiversity. All of this will contribute to the improvement of nature reserve management and the expansion of the network of sites and territories of the nature reserve fund.

2.2. International Union for Conservation of Nature and the Nature Reserve Fund of Ukraine

The collection of information, its analysis and preparation of proposals on the world practice of conservation is carried out by a reputable international public organization – the International Union for Conservation of Nature (hereinafter – IUCN). Within its framework, the World Commission on Protected Areas operates, which closely cooperates with the International Center for Environmental Monitoring in Cambridge (UK). This center has a database of all protected areas in the world.

The IUCN defines a protected area as "an area of land and/or sea specially designated for the conservation of biodiversity, natural and related cultural resources, the conservation regime within which is ensured by legislative and other effective means" and since 1992 has defined 6 categories of protected areas. These categories are defined depending on the focus of management objectives and are presented in Table 2.1.

Table 2.1 **Categories of IUCN protected areas** (after Davey, 1998)

Category index		**Name**		**Nature of management and protection**
		English	**Ukrainian**	
category I		Strict Protection	Територія для збереження дикої природи	-
	l a	Strict Nature Reserve	Природний резерват суворої охорони	management is focused mainly on scientific research
	1b	Wilderness Area	Територія для збереження дикої природи	wildlife is protected without interfering with natural processes
category II		National Park	Національний парк	management for ecosystem conservation and recreation purposes
category III		Natural Monument	Пам'ятка природи	management to protect specific natural features
category IV		Habitat/Species Management Area	Територія для збереження природних середовищ і видів	certain types of natural environments and/or certain species of flora and fauna or their groups are protected certain types of natural environments and/or certain species of flora and fauna or their groups are protected
category V		Protected Landscape/Seascape	Територія охорони ландшафту / морська акваторія	combines landscape and/or water conservation and recreation
category VI		Managed Resource Protected Area	Територія охорони ресурсів	preservation of natural values is ensured through the sustainable use of natural resources

Let us briefly consider the categories of IUCN protected areas, as it is important to work with some common categories of protected areas for different countries when addressing issues of international cooperation in the field of

conservation. In particular, it is important to compare the categories of protected areas in Ukraine with the IUCN categories.

A strictly protected nature reserve (subcategory I a) is defined as an area of land and/or sea containing outstanding or representative ecosystems, geological or physiological features and/or species of interest for scientific research and/or environmental monitoring.

The management objectives of a strictly protected nature reserve are to preserve natural environments, ecosystems, species, landscapes and ecological processes in them undisturbed as far as possible. In particular, by restricting human access to the reserve and minimizing external impacts through careful planning and implementation of research and other authorized activities.

The area of a strictly protected nature reserve must be of sufficient size to guarantee the integrity of its ecosystems and to achieve the management objectives for which the area was set aside. This area must be free from direct anthropogenic impacts both at the time of designation and in the future. Biodiversity conservation is possible here without active management or reconstruction of natural environments (which distinguishes the reserve from category IV).

A wilderness area (subcategory 1 b) is a large unaltered or slightly altered area of land and/or sea where the natural character of the area has been preserved without large settlements and constant human visitation, and whose protection and management are aimed at preserving the area in its natural state.

The overall goal of managing this protected area category is to ensure that future generations of people can enjoy the experience of communicating with nature that has not been significantly disturbed, to maintain its main features over time, and to enable local people to maintain their way of life.

The area for wildlife conservation should be of high natural quality, not subject to significant anthropogenic impact, and include outstanding ecological, geological, physical, geographical or other objects of scientific, educational, aesthetic, historical and other value. It is also important that this area provides opportunities for solitude for people who can occasionally enjoy the wilderness,

using simple, quiet, non-polluting vehicles (meaning non-motorized vehicles). In order to achieve these goals, the area to be protected must be of a sufficiently large size.

A national park (category II) is a natural area designed to protect the ecological integrity of one or more ecosystems, prevent their destruction and exploitation, and serve as a basis for meeting the spiritual, scientific, educational, recreational and tourist needs of the population, compatible with the goals of preserving the natural environment.

The overall goal of national parks management is to protect natural and scenic areas of national and international importance for the realization of spiritual, scientific, educational, recreational or tourist needs, perpetuate representative samples of physical and geographical regions, communities, genetic resources and species in their natural state, and ensure their sustainability and diversity. Visitation to a natural park should be at the level at which its territory is maintained in a natural or close to natural state, but the needs of the local population in the use of natural resources of the park are taken into account to the extent that does not contradict other objectives of its management.

The territory of the national park should include types of landscapes representative of the biogeographical region, where species of plants and animals, ecotopes and geomorphological objects have special spiritual, scientific, educational, recreational and tourist value. The area must also be large enough to include one or more integral ecosystems that have not been significantly altered by human activity.

A natural monument (category III) is an area that contains one or more specific natural or natural-cultural values that are outstanding or unique due to their rarity, typicality, aesthetic qualities or cultural significance.

The purpose of their management is to preserve these values in perpetuity and, where possible, to research and use them for educational purposes and for aesthetic enjoyment. Activities that are recognized as harmful to the purposes of the reserve are excluded and prevented. The territory of a natural monument must include one

or more significant values (which, for example, include spectacular waterfalls, caves, craters, outcrops with fossils, sand dunes with unique or representative fauna and flora, etc.). Its size must be sufficient to preserve its values.

A protected area for the conservation of natural environments and species (category IV) is an area of land and/or sea within which measures are taken to ensure the conservation of certain types of natural environments and/or species of flora and fauna. Therefore, the main purpose of managing these areas is to preserve and maintain those features of the natural environment that are necessary for the conservation of important species of flora and fauna and their communities through certain actions and special management. Scientific research and environmental monitoring are recognized as the leading activities, as they are the basis for sustainable management of natural resources. An important activity is also the use of certain natural complexes to educate people, make them aware of the values of natural environments and the need to manage wildlife conservation.

The area for the conservation of natural environments and species should play an important role in the protection of nature and the survival of species, so such an area is often defined as natural complexes that are breeding grounds for animals, wetlands, coral reefs, estuaries, meadows, forests or spawning grounds, including "grazing" fields in the seas. This area must be important for the existence of nationally or locally (regionally) important flora. The protection of these natural environments often depends on active interventions and special measures, which distinguishes this category from subcategory Ia). Its size depends on the needs of the protected species and can range from relatively small to very large in area.

Landscape protection area / marine area (category V) is an area of land and/or sea where, as a result of long-term interaction between humans and nature, a special area (water area) with significant aesthetic, ecological and/or cultural value has emerged. It is often characterized by high biological and landscape diversity. Preserving the integrity of the traditional interaction between humans and nature is essential for the protection, maintenance and evolution of such a landscape. Therefore, maintaining this harmonious interaction of natural and cultural

components of the landscape through its protection and continuation of traditional land use, construction practices, cultural traditions, lifestyles of local communities, and preservation of their social and cultural system is recognized as the main goal of protected landscape management. At the same time, it is necessary to maintain the diversity of landscapes and natural environments, as well as associated species and ecosystems, and to stop and prevent land use and actions that are incompatible with the goals of landscape conservation. It is important to provide opportunities for recreation and tourism that are consistent with the specifics and scale of the landscape, and to support scientific and educational activities that contribute to the long-term well-being of the local population.

The protected landscape area should include landscapes of high landscape value with a diversity of ecotopes, flora and fauna, as well as examples of traditional or unique land use, local customs and beliefs. This area should provide opportunities for recreation and tourism as part of the daily lifestyle and economic activities of the local population.

The Resource Protection Area (Category VI) consists mainly of unaltered natural complexes, the management of which is aimed at ensuring long-term protection and conservation of biodiversity, and, at the same time, is aimed at sustainable provision of the population with gifts (products) of nature. The territory must meet the general definition of a protected area (see above for the IUCN definition).

The management of such areas includes protection and maintenance of biodiversity and other natural values of the area, along with support for environmentally sound technologies that ensure sustainable production.

At least two thirds of the protected area should be in a natural state both at the present stage and in the future. It may include a number of modified ecosystems and even large commercial plantations. It should be large enough to withstand resource use without significant damage to the long-term conservation of its natural values.

As can be seen from the above goals for managing protected areas of different IUCN categories, these goals coincide for many categories. However, they have

different degrees of importance (priority) for them. Table 2.2 gives an idea of these correlations.

Table 2.2 **Management objectives of protected areas by category IUCN**

Management objective	IUCN category						
	Ia	**1b**	**II**	**III**	**IV**	**V**	**VI**
Scientific research	1	3	2	2	2	2	3
Wildlife protection	2	1	2	3	3	-	2
Conservation of species and genetic diversity	1	2	1	1	1	2	1
Maintaining ecological services	2	1	1	-	1	2	1
Protection of specific natural/cultural features	-	-	2	1	3	1	3
Tourism and recreation	-	2	1	1	3	1	3
Education	-	-	2	2	2	2	3
Sustainable use of natural ecosystem resources	-	3	3	-	2	2	1
Support for cultural/traditional values	-	-	-	-	-	1	2

Symbols: 1 – main goal, 2 – secondary goal, 3 – potential goal, - – no goal is set

The above-mentioned IUCN categories are a generalization of the world experience in protecting valuable natural or semi-natural areas and a recommendation for countries to use this experience. It is also considered, and recently used, as a basis for unifying the system of protected areas adopted in different countries.

The Ukrainian system of nature reserve fund categories is generally very close to the IUCN categories, although it has its own specifics. Ukraine's protected areas have analogues to all of the first five IUCN categories, as discussed below. As for category VI "Resource Protection Area", there are no analogues in the Ukrainian NRF, although certain parallels can be drawn with other protected areas. The latter include, first of all, Group I protected forests, part of Group II exploitation forests, which are exploited at a moderate pace (see the Forest Code of Ukraine), as well as territories of water protection zones (according to the Water Code of Ukraine).

Nature reserves in Ukraine correspond to category I "Strictly Protected Area" (simultaneously to both categories Ia "Strictly Protected Nature Reserve" and 16 "Wildlife Conservation Area").

The category of "biosphere reserve", which is distinguished in Ukraine, is absent in the current IUCN classification of protected areas. This is explained by the fact that, according to the Seville Strategy (1995), UNESCO biosphere reserves (reserves) are not considered as protected areas. At the same time, each biosphere reserve has a territory (functional zone) of the natural core that has the status of a protected area. Protected areas of a certain category may also be part of the buffer zone of a biosphere reserve. Thus, a biosphere reserve combines the functions of biodiversity conservation and sustainable socio-economic development, but is not considered by the IUCN as a protected area.

The national nature parks of Ukraine perform the same functions and pursue the same management objectives as IUCN Category II "National Parks". At the same time, the large management areas of Ukrainian NNPs indicate the presence of elements of category V "Protected landscape/marine area", and the fact that each of the Ukrainian NNPs includes a protected area allows us to speak about the presence of the IUCN category I element. It is also worth noting that the functional zoning and functions of our national nature parks make them very similar to UNESCO biosphere reserves.

The criteria for the selection and functions of natural monuments in the Ukrainian NRFs are similar to natural monuments (category III) according to the IUCN classification.

The reserves of both national and local importance, as well as the protected tracts of Ukraine, fully fall under the IUCN category IV "Area for the Conservation of Natural Habitats and The category "regional landscape park" corresponds to the IUCN category V "Landscape/marine protected area".

The above categories of protected areas in Ukraine are classified as natural areas. The same national categories of PAs that are artificially created objects, namely botanical garden, dendrological park, zoological park, park-monument of landscape gardening, can be considered as corresponding to IUCN Category V "Protected landscape/marine area". These grounds are based on the fact that artificially created objects included in the Ukrainian NRF are considered as

territories where harmonious relations between humans and the natural environment have developed, these territories are of high aesthetic, cultural and/or environmental value and are therefore subject to protection. This interpretation of artificially created protected areas generally coincides with the IUCN Category V definition (see above).

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention, Ramsar, Iran, 1971) was launched on February 2 (now celebrated as International Wetlands Day), 1971 in the Iranian city of Ramsar and thus became known as the Ramsar Convention. By adopting the Law on Ukraine's Participation in the Convention on October 29, 1996, Ukraine renewed its membership in the Convention as part of the USSR of December 26, 1975. By Resolution No. 935 "On Measures for the Protection of Wetlands of International Importance," Ukraine identified 22 potential wetlands of international importance (previously, only 3 Ukrainian wetlands were listed in the List of Wetlands of International Importance), for which it subsequently received international certificates from the Ramsar Office. Most of the wetlands of international importance in Ukraine have already been protected or are prospective for protection (the list and characteristics of these sites are given in the Annex, Table Z) The working body of the Ramsar Convention is the Conference of the Contracting Parties, which meets once every three years to adopt special resolutions and recommendations. In 1996, at the 6th meeting of the Conference of the Contracting Parties to the Convention on Wetlands in Brisbane (Australia), the first ever Strategic Action Plan for 1997–2002 was approved, and since 2003 the Strategic Action Plan for 2003–2008 has been in force, One of the main objectives of the second Strategic Action Plan is to increase the number of wetlands of international importance to 2000 (at the time of writing this manual there were already more than 1200). Ukraine, with its still fairly well-preserved and valuable wetlands, is well positioned to at least double the number of Ukrainian sites on the List of Wetlands of International Importance.

Between the meetings of the Conference of the Contracting Parties, the Ramsar Convention is governed by the Ramsar Bureau, which has been taken over by IUCN. The Convention works closely with other non-governmental organizations, especially Wetlands International.

In order for a wetland to be designated as a site of international importance, it must meet at least one of the 8 criteria, which are divided into four groups. The content of these criteria and their groups is presented in Table 2.3.

Table 2.3 **Criteria for international importance of a wetland**

Group of criteria	**Content of the criteria**
A. Typicality, rarity or uniqueness of the site	1 – to be a typical, rare or unique example of natural or semi-natural (artificial) wetlands for the relevant biogeographic region
B. Species of plants and animals that are threatened with extinction worldwide	2 – be a habitat for vulnerable species, endangered species and ecological communities 3 – to be especially valuable as an environment for maintaining the biological diversity of a certain biogeographical region 4 – be especially valuable as a habitat for plant and animal species at critical stages of their biological cycles
Special criteria for water and wading birds	5 – be places of regular stay of more than 20 thousand individuals of wetland birds 6 – to be regular habitats of at least 1 percent of the biogeographic population of one species or subspecies of birds of the wetland complex
Special criteria for fish	7 – be particularly valuable as an environment for maintaining a certain ratio of fish species, their age structure, which generally determines the value of wetlands and their biological diversity 8 – be important spawning, feeding or wintering grounds for local fish species that are crucial for maintaining their populations

In Ukraine, the identification, delineation and submission of materials to the Bureau of the Convention on Wetlands is carried out in accordance with the

Procedure for Granting Wetlands the Status of Wetlands of International Importance, approved by the Cabinet of Ministers of Ukraine on August 29, 2002 year № 1287.

For each wetland of international importance, an Information Description is prepared in a special form, which, in addition to information on compliance with the above criteria, provides a wide range of ecological and socio-economic data on the site, natural resource use within it and management for the conservation of its natural values. Wetland conservation is managed through the development and implementation of an appropriate action plan (management plan).

If significant negative changes have occurred within a wetland of international importance, the wetland should be included in the Monterey Protocol (by the name of the city where this procedure was approved) upon the submission of a public organization, the Contracting Party itself or international experts, and the Contracting Party should take appropriate measures to improve the environmental situation. Our wetlands "Karkinit Bay" and "Yahorlytska and Tendrivska bays" (nowadays, respectively, "Dzharylgachska and Karkinitska bays", "Yahorlytska bay", "Tendrivska bay") were also on this "black" list (in 2003 they were removed from the list).

In contrast to the Monterey Protocol, at the last meeting of the Conference of the Parties to the Convention on Wetlands in Valencia, Spain, it was decided to create a list of model wetlands under the San Jose Protocol (the idea was proclaimed in San Jose at the 7th meeting of the Conference of the Parties to the Convention on Wetlands).

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979), which entered into force for Ukraine on March 19, 1999, obliges the Contracting Parties to conserve and, if possible and appropriate, restore those habitats that are important for preventing the extinction of migratory species (Article III). This Convention also provides for the conclusion of special international agreements for certain species of migratory animals or their groups (Articles IV and V). The Convention contains Appendix I "Endangered Migratory

Species" and Appendix II "Migratory Species that may be subject to Agreements", i.e. a list of species whose status is unfavorable and for the conservation and regulation of their use international agreements are required. While Appendix I contains only the pink and Dalmatian pelicans, the peregrine falcon, the white-tailed eagle, the blackbird and the slender-billed crowned vulture, Appendix II contains almost all other migrants: bats, dolphins, storks, ducks, hawks, falcons, titmouse, woodcock, shepherds, herons, cranes and most migrant species from other groups.

The key agreement within the framework of the Bonn Convention **is the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (1995)**, to which Ukraine acceded in accordance with a special law of Ukraine of July 4, 2002. When the distribution area of a bird species is located on the territory of more than one country, the Parties must cooperate and coordinate their actions (Article PI of the Agreement). The Agreement includes three annexes. Appendix I defines the area of the Agreement (the territory of Ukraine is fully included in this area), Appendix II contains a list of waterbird species covered by the Agreement (almost all migrants from this group), and Appendix III is an action plan aimed at their conservation. An integral part of Appendix III is the table "Status of Migratory Waterbird Populations", which divides bird species into three groups and categories, according to the criteria that determine the degree of threat to their extinction.

The Parties to the Agreement must develop action plans for the conservation of individual species, prohibit the introduction of non-native species of animals and plants, and try to create protected areas to preserve the habitats of migratory species, as well as establish special protection for wetlands of international importance.

Since May 14, 1999, Ukraine has also been a Contracting Party to another agreement of the Bonn Convention – **the Agreement on the Conservation of Bats in Europe (1991)**. According to it, each Party must prohibit the taking of bats of all species, protect their habitats and take the necessary conservation measures, especially the replacement of highly toxic chemicals used to treat trees with safer alternatives.

Ukraine also intends to accede to the Agreement of the same Convention on the Conservation of Small Cetaceans of the Black Sea, Mediterranean Sea and Adjacent Waters of the Atlantic Ocean (1996).

Under the Bonn Convention, a Memorandum of Understanding on the Conservation of the Slender-billed Kittiwake *Numenius tenuirostris* (found only in passage in Ukraine) has already been signed, and a similar memorandum is being developed to conserve the globally endangered reed warbler *Acrocephalus paludicola*, whose range is concentrated mainly within the Ukrainian and Belarusian Polissya. *Acrocephalus paludicola* is already protected in the Shatsk National Nature Park, Rivne Nature Reserve, Prypiat-Stokhid (Volyn Oblast) and Zamhlaia Regional Nature Parks, and several nature reserves in Ukraine, and it is planned to protect the newly discovered nesting sites.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, Washington, 1979) is also a legal act of global scope (in force for Ukraine since May 14, 1999). The main reason for the conclusion of the Convention was the recognition of the need for international cooperation to protect a number of species of wild fauna and flora from overexploitation in international trade. The Convention contains three appendices of species of animals and plants. Appendix I includes endangered species whose trade in which causes or is likely to cause adverse impacts on their existence. Appendix II includes species that are not necessarily endangered at present, but may become so if trade in specimens of such species is not strictly regulated. Appendix III includes all species that are determined by any Party to be subject to regulation within its jurisdiction. Only the following species are listed in Appendix I from those registered in Ukraine: river otter, Przewalski's horse, Dalmatian pelican, red-tailed eagle, white-tailed eagle, peregrine falcon, slender-billed kite, Atlantic sturgeon, while Appendix II includes all felines, cetaceans, falcons, bustards, owls, cranes, black stork, brown bear, osprey, red-breasted goose, marsh turtle and some other species of animals orchidaceous from plants. The removal from nature and transfer (trade) of species listed in all three appendices of the Convention requires special internationally

recognized permits from the central executive authority in the field of the environment of Ukraine.

The Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972), which is administered by UNESCO, has been in force in Ukraine since October 4, 1988. The National Commission of Ukraine for UNESCO under the Ministry of Foreign Affairs of Ukraine is responsible for the implementation of the Convention in Ukraine, and the Embassy of Ukraine in France is the Mission of Ukraine to UNESCO. Within the framework of this Convention, criteria, application forms, and their approval have been developed, and Lists of the World Natural, Natural and Cultural Heritage, guidelines, etc. have been created. St. Sophia of Kyiv and the Kyiv-Pechersk Lavra, as well as Old Lviv, have already been inscribed on the World Heritage List. The other two lists do not yet include Ukrainian sites. The requirements of the Convention are extremely high and a very serious selection of world heritage sites is underway. In order for a natural heritage site to be recognized worldwide, it must be the most representative example of major periods of Earth's history, or of ecological and biological processes, or represent natural phenomena or picturesque natural landscapes of exceptional aesthetic value, or contain the most representative and important natural environments for biodiversity conservation.

The Convention on the Conservation of European Wildlife and Natural Habitats. Berne Convention is actually the main mechanism for implementing the Convention on Biological Diversity on the continent, although it was launched in 1979 in Bern (Switzerland). Ukraine acceded to the Convention in accordance with the Law of Ukraine "On Accession of Ukraine to the Convention on the Conservation of Wild Flora and Fauna and Natural Habitats in Europe of 1979" of October 29, 1996, with the reservations that Ukraine allows selective regulation of the number of wolves and brown bears in a limited number and under appropriate control in order to prevent negative impact of these species on populations of other species, serious damage to livestock and other property. The hunting of the red deer is also permitted due to its sufficiently large number and distribution in Ukraine. In

addition, this Law allows the use of traps and nets for catching animals for scientific purposes and their relocation, as well as traps for catching wolves, common marmots, beavers, black ferrets, forest martens and stone martens.

The main tasks and obligations of the Bern Convention are (Bype, 2000):

- conservation of wild flora and fauna, especially in transboundary regions,
- maintaining populations of wild flora and fauna at a level that is consistent with the ecological, scientific and cultural characteristics of the region,
- development of a national policy on the conservation of flora and fauna, and inclusion of issues related to this conservation in environmental programs,
- special measures for species listed in the Convention,
- prohibition of intentional hunting of animals through the introduction of licenses, restrictions, etc. The Bern Convention includes lists of plant and animal species subject to special protection

The Bern Convention also provides for the creation of a system of "areas of special conservation interest" that will form the Emerald Network of Europe. The criteria for determining areas of special interest are the presence within their boundaries of rare and endangered species of plants and animals selected from Appendices I and II as requiring special conservation measures and included in a special list, and/or rare and endangered habitat types. Among the 80 or so types of rare and endangered habitats are river gravel ecotopes, caves, dunes, beech and oak-hornbeam forests, fir, mountain spruce and mixed forests in gorges and on slopes, acid peat oligotrophic and transitional bogs, and sparse forests in the steppes.

The package of documents on the Emerald Network includes: Emerald Standard Data Form and explanations to it, List of natural and anthropogenic impacts and activities, European Classification of Natural Environment Types, Emerald Network computer program, etc. The Emerald Network of Europe is an analogue of the European Union's NATURA 2000 program, which was developed to implement EU Directive 79/409/EEC on the Conservation of Wild Birds and EU Directive 92/43/EEC on the Conservation of Wild Fauna and Flora. It should be noted that the NATURA 2000 program is mandatory for EU member states and includes a special

financial mechanism to ensure appropriate environmental protection measures. Although this document is not binding on Ukraine, its aspirations to join the European Union necessitate that it now closely monitor the implementation of the Bern Convention.

Ukraine's top priority is to include nature reserves and national parks, all of which meet these criteria, in the Emerald Network. This will increase the responsibility for the conservation of certain rare and endangered species of biodiversity and natural environments and allow us to more actively acquire the experience gained in Europe in environmental management. Currently, the Convention operates under the auspices of the Council of Europe, its governing body is the Standing Committee consisting of representatives of all Contracting Parties, which meets annually and adopts resolutions on the interpretation of the Convention's provisions, recommendations for the conservation of certain species (groups of species), methodological guidelines, etc. Every 4 years, the Standing Committee issues reports on the general policy of biodiversity conservation National and international non-governmental (public) organizations play a significant role in monitoring the implementation of the Convention's objectives. Every year, the Standing Committee of the Convention considers complaints regarding the conservation of a particular species or type of natural environment in European countries (the number of such cases has exceeded 400). More than 20 recommendations and a number of on-site assessments have already been made in response to the complaints, although the main work on eliminating the grounds for complaints is carried out in the respective countries.

The Pan-European Strategy for the Conservation of Biological and Landscape Diversity was prepared by the Council of Europe in cooperation with the European Center for Nature Conservation (Tilburg, the Netherlands) and approved by the Ministers of Environment of 55 European countries at the Ministerial Conference "Environment for Europe" (Sofia, October 23–25, 1995). The main reason for the development of the strategy was the need for a more coherent and thus more effective use of existing policy tools, initiatives,

mechanisms, funds, research and information for the conservation of Europe's biological and landscape diversity. The goals of the Pan-European Strategy are: to significantly reduce threats to Europe's biological and landscape diversity, to enhance its conservation potential, to strengthen the ecological integrity of the whole of Europe and to ensure the full involvement of the public in these matters.

Its tasks include:

- preservation and restoration of the natural state of key ecosystems, habitats (ecotopes), flora and fauna species and landscapes through the creation of the Pan-European Ecological Network and its effective management;
- sustainable management and utilization of the positive potential of Europe's biological and landscape diversity by ensuring the optimal use of social and economic opportunities at the national and regional levels;
- taking into account the objectives of conservation and sustainable (balanced and non-depleting) use of biological and landscape diversity in all sectors that use or affect this diversity;
- Improving public awareness and knowledge of biological and landscape diversity issues, as well as enhancing their participation in activities aimed at preserving and increasing this diversity;
- Ensuring a better understanding of the state of Europe's biological and landscape diversity and the processes that contribute to its sustainability; and ensuring adequate financial resources for the implementation of the Pan-European Strategy.

The Convention on Biological Diversity defines biological diversity as the variability of living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part. This concept includes diversity within a species, between species and ecosystem diversity. Landscape diversity is defined as a formal expression of the multiple relationships that currently exist between an individual or society and a topographically defined area, and whose outward manifestation is the result of the influence of natural and human factors and their combinations over time.

Other international conventions and agreements also relate to the territories and objects of the Ukrainian NRF in a certain way. For example, the UN Framework Convention on Climate Change (ratified by Ukraine on October 29, 1996) and the Vienna Convention for the Protection of the Ozone Layer (Vienna, 1985, in force for Ukraine since May 20, 1986) may be of interest when it comes to the conservation of peat ecosystems, as they contain large reserves of carbon dioxide, the release of which can affect the climate of the region. The European Convention on the Protection of the Archaeological Heritage (Valletta, 1992) should be taken into account when there are archaeological heritage sites within existing or prospective protected areas and nature reserves. The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992), which has been in force in Ukraine since July 1, 1999, and the Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991) ratified on March 19, 1999, as well as the European Convention on Basic Principles of Transboundary Cooperation between Territorial Communities or Authorities of 1980 (Ukraine acceded to it on July 14, 1993) cannot be ignored by nature reserve institutions in the border regions of Ukraine. The Convention on Cooperation on the Protection and Sustainable Use of the Danube River (ratified by the Law of Ukraine of January 17, 2002) applies to all protected areas in the Danube region. The United Nations Convention to Combat Desertification (Law of Ukraine on Accession of July 4, 2002) is relevant for the arid regions of Ukraine. The development of the Black Sea Red Data Book and the Biodiversity Protocol makes the Convention on the Protection of the Black Sea from Pollution, which is in force for Ukraine since February 4, 1994, relevant for the Ukrainian nature reserve fund. The European Landscape Convention, which was launched in Florence (Italy) in 2000 and operates under the auspices of the Council of Europe, is also relevant to the problems of protected areas. The Framework Convention on the Protection and Sustainable Development of the Carpathian Mountains was initiated by Ukraine at the Fifth Conference of Ministers of Environment "Environment for Europe" (May 21–23, 2003, Kyiv).

The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, which was launched in 1998 in Aarhus (Denmark) at the Pan-European Interministerial Conference "Environment for Europe" and ratified by the Verkhovna Rada of Ukraine on June 6, 1999, is particularly relevant to the nature reserve fund. The purpose of the Convention is to promote the protection of the right of everyone of present and future generations to live in an environment conducive to their health and well-being, and each Party shall guarantee the rights of access to information, public participation in decision-making and access to justice in environmental matters.

Interstate cooperation in environmental protection also became mandatory for Ukraine with the conclusion of the Agreement between the Ministry of Environment and Territorial Planning of the Republic of Moldova, the Ministry of Water, Forests and Environmental Protection of Romania and the Ministry of Ecology and Natural Resources of Ukraine on June 5, 2000 in Bucharest (Romania) on cooperation in the area of protected areas in the Danube Delta and the lower reaches of the Prut River, where the Danube Biosphere Reserve is the subject of cooperation. **The Declaration on Cooperation in the Creation of the Lower Danube Green Corridor** (Bulgaria, Romania, Moldova and Ukraine), where Ukraine proposed to include about 50 thousand hectares of existing protected areas, and envisages the creation of new nature reserve sites and the restoration of a number of disturbed ecosystems.

The European Red List of globally threatened species of animals and plants (1991) was approved at an expanded meeting of the United Nations Economic Commission for Europe with the participation of the Ukrainian delegation in Nurmess (Finland) in the summer of 1986 and is mandatory for special protection. The most rare species in Ukraine from this list are included in the Red Data Book of Ukraine, while others are listed in its annexes and are also subject to conservation control. In particular, for the collection, destruction and damage of these species, taxes are determined to calculate the amount of compensation (fines).

Ukraine also has certain interests abroad, in particular in the Antarctic. In 1992, our country became one of the successors of the USSR to the Antarctic Treaty

of 1961 (Resolution of the Verkhovna Rada of Ukraine of September 17, 1992), according to which Antarctica can be used only for peaceful purposes. In 2002, Ukraine acceded to the Convention on the **Conservation of Antarctic Marine Living Resources** of 1982, according to which any activity there should follow the following conservation principles: preventing the reduction of commercial species below their reproduction levels, restoring depleted populations, preventing or minimizing the risk of negative changes in the marine environment in order to ensure the sustainable conservation of Antarctic marine living resources.

The list of basic international conventions, agreements and other legal mechanisms on nature conservation, conservation of biological and landscape diversity is given in Table 4 of the Appendices.

Questions and tasks for independent work

1. What are the most important international documents on the conservation of biological and landscape diversity?
2. Define wetlands according to the Ramsar Convention.
3. What was the reason for the adoption of the Convention on International Trade in Endangered Species of Wild Fauna and Flora?
4. Name the main provisions of the Convention on the conservation of migratory species of wild animals.
5. What are the annexes to the Bern Convention (1979) on the protection of wild flora and fauna and natural environments in Europe?
6. What are the features of the Convention on Biological Diversity, adopted in Rio de Janeiro on June 5, 1992?
7. Where was the fifth Conference of Ministers of Environment held within the framework of the "Environment for Europe" process? What priority issues were considered here?
8. Where and when was the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters adopted?

9. What are the main points of the Regulation on the Green Book of Ukraine, approved by the Cabinet of Ministers of Ukraine on August 29, 2002, № 1286?

11. What are the main objectives of the Berne Convention (1979)?

12. What is the difference between the Monterey Protocol and the San Jose Protocol?

13. What is the relation to the organization of nature reserves in Ukraine have the UN Framework Convention on Climate Change and the Vienna Convention for the Protection of the Ozone Layer of the Atmosphere?

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SECTION 3. CLASSIFICATION OF PROTECTED AREAS AND OBJECTS: NATURAL AREAS AND OBJECTS, ARTIFICIALLY CREATED OBJECTS

Outline

3.1 Concept of territories and objects of special state protection.

3.2 Classification of the nature reserve fund of Ukraine.

3.3 International classification of protected areas.

The development of protected areas and objects is becoming an integral part of the state environmental policy and one of the conditions for integration into international cooperation in the environmental field. In this regard, it is important to study the peculiarities of the national classification of protected areas and objects and its comparison with international standards.

3.1 Concept of territories and objects of special state protection

Natural territories and objects of special state protection play a key role on Earth in preserving its natural framework, reproduction of life and biological diversity. Today, about 65% of the planet's communities and ecosystems have been destroyed or severely altered.

Over the past decade, the number of protected areas and their area has more than doubled worldwide: more than 12% of the land surface is now under protection (except for Antarctica, where the regime of strict protection covers 10% of its territory).

Trends in the development of the national network of territories and objects of special state protection, primarily those of the nature reserve fund, during this period were close to the world's. Thus, during the years of independence, the area of the nature reserve fund of Ukraine has more than doubled, but it is insufficient and remains much smaller than in most European countries, where the average percentage of protected areas is 15.3%. The area of protected land per capita in Europe is about 2,220 m^2, compared to 570 m^2 in Ukraine.

As of January 1, 2012, the total area of natural and biosphere reserves and national parks (70 institutions) amounted to 1672.0 thousand hectares (48% of the protected areas and 2.8% of the total area of Ukraine).

Compared to 2000, the area of the nature reserve fund increased by 1168.1 thousand hectares, and compared to 2010, it increased by 108.2 thousand hectares, but the growth rate of the protected areas lags behind the objectives of the National Program for the Formation of the National Ecological Network of Ukraine for 2000–2015 (Table 3.1).

Table 3.1 **Territories and objects of the nature reserve fund of Ukraine**

Category of territories and objects of the nature reserve fund	**Land area, thousands of hectares**				
	state on 1.09.00	**state on 1.01.10**	**state on 1.01.11**	**state on 1.01.12**	**state on 2015**
National nature parks	600,0	1001,8	1215,8	1215,8	2329,0
Nature reserves	160,0	198,7	205,3	205,3	422,0
Biosphere reserves	212,0	246,4	250,9	250,9	301,0
Other categories	1427,0	1821,1	1786,9	1895,1	3223,0
Total	***2399,0***	***3268,0***	***3458,9***	***3567,1***	***6275,0***

Throughout the history of environmental protection, the term *"protected area"* has been and still is the most widely used. The Convention on Biological Diversity states: *"a protected area is a geographically distinct area of land where natural resources are managed and used for specific conservation purposes".* The IV World Congress of National Parks and Protected Areas adopted the following definition*: "a protected area is an area of land or sea specially designated for the conservation of biodiversity, natural and related cultural resources, and where the environmental regime is ensured by legislative or other effective means".*

The core of the national unified territorial system of natural territories and objects of special state protection is primarily recognized as the territories and objects of the nature reserve fund (NRF) and some other categories of natural territories and objects.

The state's designation of territories and objects of special protection with their

full or partial withdrawal from economic circulation and granting them a special protection status is an attempt to counteract degradation processes in the environment.

According to the Law of Ukraine "On Environmental Protection" (1991), *"Natural territories and objects subject to special protection form a single territorial system and include territories and objects of the nature reserve fund, resort and health resort, recreational, water protection, field protection and other types of territories and objects determined by the legislation of Ukraine".*

The "other" territories, i.e., those whose special protection was not yet envisaged at the time of the adoption of the Law of Ukraine "On Environmental Protection", today include, in particular, rare and endangered typical plant communities listed in the Green Book of Ukraine, wetlands of national and international importance.

As a rule, the system of territories and objects of special state protection includes territories (water areas) where almost unchanged or partially changed natural landscapes have been preserved. They are protected as a national treasure and, at the same time, as an integral part of the global system of natural areas and sites under special protection.

Among the types of territories and objects of special legal protection, the central place is occupied by the nature reserve fund of Ukraine.

The nature reserve fund consists of land and water areas, natural complexes and objects that have special environmental, scientific, aesthetic, recreational and other values and are allocated for the purpose of preserving the natural diversity of landscapes, the gene pool of flora and fauna, maintaining the overall ecological balance and ensuring background monitoring of the environment.

According to the law, the nature reserve fund is protected as a national treasure, which is subject to a special regime of protection, reproduction and use. The Fund is considered an integral part of the global system of natural areas and objects under special protection.

3.2 Classification of the nature reserve fund of Ukraine

The system of nature protection categories began to be formed at the same time as the nature reserve business was born.

The category of nature reserve fund is a form of organization, protection status and type of conservation, restoration and use of territories and objects that are part of the nature reserve fund.

The Law of Ukraine "On the Nature Reserve Fund of Ukraine" (1992) defines the classification structure of the nature reserve fund of Ukraine, which includes eleven categories of territories and objects, namely:

- ✓ nature reserves;
- ✓ biosphere reserves;
- ✓ national natural parks;
- ✓ regional landscape parks;
- ✓ nature reserves;
- ✓ natural monuments;
- ✓ protected tracts;
- ✓ botanical gardens;
- ✓ dendrological parks;
- ✓ zoological parks;
- ✓ parks-monuments of landscape art.

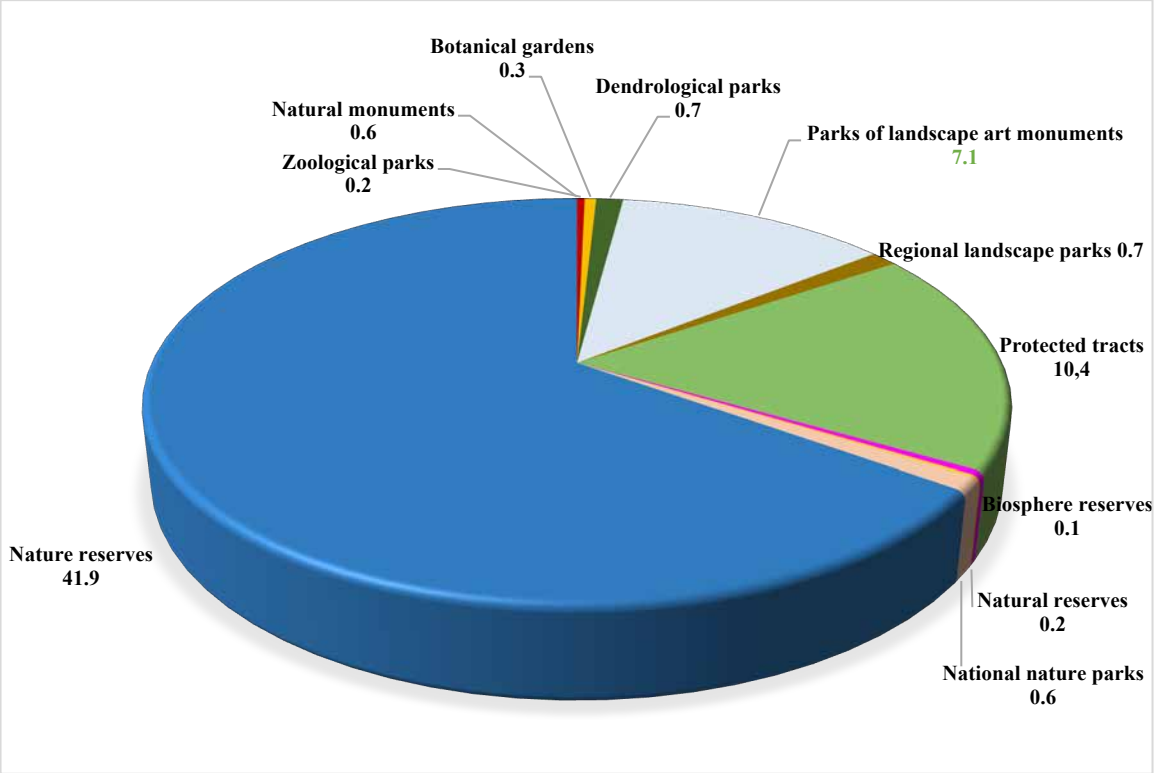
The nature reserve fund of Ukraine includes: *natural territories and objects* (nature reserves, biosphere reserves, national nature parks, regional landscape parks, reserves, natural monuments, protected tracts); *artificially created objects* (botanical gardens, dendrological parks, zoological parks, parks-monuments of landscape art).

The number of territories and objects of the Ukrainian NRF by category as of January 1, 2011 is shown in Figure 3.1.

The functions of each of the listed NRF objects, the purpose of their creation and the tasks set are clearly regulated by national legislation, in particular by the Law of Ukraine "On the Nature Reserve Fund of Ukraine".

Ukrainian legislation establishes a special legal regime for each category of protected areas and objects. The regime of the territories and objects of the nature reserve fund is determined in accordance with the Law of Ukraine "On the Nature Reserve Fund of Ukraine", taking into account their classification and purpose. Specific requirements for the regime of certain protected areas and objects within the limits determined by law may be established by regulations on these areas or objects.

The level of protection regime, which, in turn, is determined by the ecological, scientific, historical and cultural value of the objects, is a feature that distinguishes between the territories of protected areas of *national and local importance*.



Picture 3.1 **Number of protected areas and objects in Ukraine by category (in %)**

At the same time, a number of PA categories can be of both national and local significance (this applies to nature reserves, natural monuments, botanical gardens, dendrological parks, zoological parks and parks-monuments of landscape art). Regional landscape parks and protected tracts are categories of protected areas of

local importance, while nature reserves, biosphere reserves and national nature parks are created only at the national level. Biosphere reserves are a category of protected areas of international importance. Their creation and operation requires compliance with not only national but also international procedures. All biosphere reserves are elements of the relevant global network, the general register of which is maintained by the UNESCO Man and the Biosphere Program.

The *legal regime* of certain categories of protected areas is either *unified*, that is, the same for the entire territory or object, or *differentiated* depending on the functional zoning of the territories. For example, the legal regime of nature reserves, protected tracts, natural monuments, and sanctuaries is unified.

A differentiated regime, in accordance with the functional zoning of the territories, is established for biosphere reserves (with the allocation of zones: protected, buffer, anthropogenic landscapes and regulated protected areas), national nature parks (with the allocation of a protected area, a regulated recreation area, a stationary recreation area and an economic area), zoological parks (exhibition, scientific, recreational and economic areas). Zoning can also be carried out on the territories of botanical gardens, dendrological parks, regional landscape parks, parks-monuments of landscape art.

Categories of protected areas can also be classified by *legal status*. Some of them are always legal entities, while others are created (declared) without such status. Thus, nature reserves, biosphere reserves, national nature parks, regional landscape parks, as well as botanical gardens, dendrological parks and zoological parks of national importance always have the status of a legal entity. Objects are declared as reserves, natural monuments or protected tracts without granting them the status of a legal entity. Botanical gardens, dendrological parks, zoological parks of local importance and parks - monuments of landscape art may be recognized as legal entities or declared as the territory of NRF without such status.

Legislation also regulates the type of legal entity that is assigned to the registration of protected areas and objects. For the territories with the highest degree of protection (nature reserves, biosphere reserves, botanical gardens and

dendrological parks of national importance), the status of a research institution is provided. The same status, but in an alternative order, can be granted to botanical gardens and dendrological parks of local importance.

National natural parks combine the status of recreational, cultural, educational and research institutions. Zoological parks of national importance (they are nature conservation, cultural, educational and research institutions) and regional landscape parks (nature conservation and recreational institutions) have a similar legal status.

Thus, the territories and objects of the nature reserve fund of Ukraine can be divided by:

- origin (natural, artificial);
- categorical affiliation (types of categories, subcategories, e.g., nature reserves);
- administrative rank (international, national, local);
- functional value (mono-functional, multifunctional);
- legal status (legal entity, non-legal entity, i.e., the land user is responsible for conservation).

The existing legislation of Ukraine in the field of protected areas, its international obligations, the results of the latest scientific research, as well as current European and global conservation trends indicate the need to bring the national system of nosological categories of protected areas in line with the standards of the International Union for Conservation of Nature.

3.3 International classification of protected areas

The collection of information and its analysis on the world practice of protecting natural objects is carried out by the international non-governmental organization – the International Union for Conservation of Nature (IUCN), founded in 1948. The main statutory activity of the IUCN is to assist communities of any kind in the conservation of biodiversity and the implementation of environmentally friendly and sustainable methods of using natural resources.

According to the IUCN classification of protected areas (1994), which is the most recognized among other international classifications, protected areas in the world can be divided into six categories.

Category Ia – Strict Nature Reserve – an area of land and/or sea containing outstanding or representative ecosystems, geological or physiological features and/or species of interest for scientific research and/or environmental monitoring.

The objects of conservation are undisturbed natural areas of sufficient size that are permanently free from anthropogenic impact. These sites are protected under a very strict regime.

Category Ib – Wilderness Area – a large unchanged or slightly changed area of land and/or sea, where the natural character of the territory has been preserved without large settlements and constant visits by the population, the protection and management of which is aimed at preserving the territory in its natural state.

Category II – National Park – is a natural area designed to protect the ecological integrity of one or more ecosystems, prevent their destruction and exploitation, and to serve as a basis for meeting the spiritual, scientific, educational, recreational and tourist needs of the population, compatible with the goals of preserving the natural environment.

Category III – Natural Monument – is a small protected area that is allocated for the preservation of nature-related cultural values that are distinctive or unique due to their rarity, typicality, aesthetic qualities or cultural significance.

Category IV – Habitat/Species Management Area – a protected area that is allocated for the purpose of conservation for the special management of individual species populations or their habitats.

Category V – Protected Landscape/Seascape – a protected and rehabilitation area (water area) where, as a result of long-term interaction between humans and nature, a special area (water area) with significant aesthetic, ecological and/or cultural value has emerged.

Category VI – Managed Resource Protected Area – a large protected area that is allocated for long-term protection, traditional and modern balanced, controlled

use and continuous reproduction of natural resources and biodiversity, mainly unchanged ecosystems, as well as for the sustainable use of nature's gifts by the population.

In addition to the above-mentioned IUCN categories, many other international environmental organizations distinguish four additional international categories.

Category VII – Anthropological Reserve – is created to preserve the historical anthropological values of nature, living conditions of populations of unique, rare and endangered indigenous ethnic groups, reproduction of their gene pool, ensuring conditions for their traditional economy, etc.

Category VIII – Multiple Use Management Area – is created as a model for diverse, mostly environmentally balanced, development of the socio-economic sphere in nature management and natural resource use, balanced and sustainable management.

Category IX – Biosphere Reserve. At the request of the state concerned, it is designated by the International Coordinating Council of the UNESCO Man and the Biosphere Program, and is therefore recognized internationally in accordance with the existing statutory framework.

Category X – Natural World Heritage Sites. It is created in accordance with the requirements of the World Heritage Convention.

The first five categories are aimed exclusively at preserving biodiversity. The strictest conservation regime is typical only for the first three categories, although it is possible in certain areas and protected areas of categories IV–X.

Control questions and tasks

1. Identify the main factors that determine the urgent need for the developmnt of territories and objects of special state protection within the territory of Ukraine.

2. What is the difference between the concepts of "protected area", "nature reserve fund", "natural areas and objects subject to special protection"?

3. Define the purpose of the organization of territories and objects of the nature reserve fund.

4. Specify the categories of territories and objects of the nature reserve fund of Ukraine.

5. Reveal the features that distinguish categories of territories and objects of nature reserve fund.

6. Specify the main tools to ensure the preservation of territories and objects of nature reserve fund of Ukraine.

7. Indicate the feature that establishes the level of protection of the nature reserve fund.

8. Explain the categories of nature reserve fund for which a unified/differentiated protection regime is established.

9. Specify the main categories of protected areas according to the IUCN classification.

10. Why do many international environmental organizations distinguish four additional categories of protected areas?

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SECTION 4. FORMATION OF A NETWORK OF PROTECTED AREAS

Outline

4.1 Prerequisites for the formation of a network of protected areas.

4.2 Pan-European ecological network.

4.3 General provisions for the establishment of a national ecological network.

Negative environmental changes caused by a significant anthropogenic load have led to a significant decrease in biodiversity. To preserve it, it is necessary to create a network of protected areas and ensure an effective management system. The creation of a network of protected areas is based on the idea of the integrity of nature, interconnectedness and inseparability of its component systems at all levels.

4.1 Prerequisites for the formation of a network of protected areas territories

The idea of creating a network of territories and objects of the nature reserve fund arose in the mid–1970s and was caused by the fact that fragmentation of protected areas led to their degradation. Concepts were developed to create unified environmental protection systems, territorial systems of environmental restoration, special environmental management regimes, the theory of natural frameworks, regional systems of protected areas, territorial integrated nature protection schemes, and others. Perhaps, these carefully developed, scientifically based concepts were not implemented because there were no legislative, regulatory, political, administrative, and social mechanisms for their implementation, and nature reserves were formed somewhat chaotically, based on the needs to preserve a particular component of nature. This led to the lack of a comprehensive approach to the development of protected areas and the implementation of environmental protection measures.

Today, these developments are reflected in the concept of forming an ecological network, which at this stage of environmental protection is integrative. It

is a mandatory link that combines all environmental protection concepts and systems into a single whole.

The ecological network is a complex multifunctional natural system whose main functions are to preserve biodiversity, stabilize ecological balance, increase landscape productivity, improve the environment, and ensure sustainable development of the state.

Ecological network development as a specific measure for nature protection has been developed in Europe for more than 15 years. The reason for this was the need to solve the problems associated with the restoration of large herbivores within their historical ranges, namely, to provide long-distance movement and migration routes by creating a network of connected areas of natural areas.

Later, nature conservationists in leading countries became convinced that nature reserves should perform not only the function of preserving and dispersing rare and endangered, scientifically or aesthetically valuable species of biota, important specific areas, ecosystems, or other individual objects, landscapes or other individual natural objects, centers of biodiversity (biotic aspect of the ecological network), but also the function of ensuring the regulation of biosphere processes and maintaining ecological balance, enhancing the ability of the biogeographic cover to self-healing (ecostabilizing aspect of the ecological network).

Further developments in this area have shown that the ecological network is a key element in the practical implementation of the ecological paradigm of nature management and conservation of the natural framework of national territories and the most effective mechanism for fulfilling the objectives of the Convention on Biological Diversity, adopted on June 5, 1992 in Rio de Janeiro. To a certain extent, it took over some of the functions of the Bonn, Bern and Ramsar Conventions, as it proclaimed the preservation of not individual links of nature, but the main levels of organization of its biota.

On the other hand, in the same year, the Council of Europe adopted the concept of the European Ecological Network as the idea of a Pan-European system for the protection of the European community's natural heritage. Undoubtedly, this

is the most fundamental idea of recent decades in the field of environmental protection.

The general approaches to the development of the Pan-European Ecological Network include the following:

- *integrity* – any local ecological network is an integral part of the continental ecological network;

- *unity* – implies territorial, species and functional unity;

- *complementarity* – biodiversity, functions, habitats and territories;

- *diversity* – provides for a variety of forms of environmental protection;

- *restoration* – of lost natural values; correspondence – to the nature of biogeographical areas;

- *hierarchy* – consists in building an ecological network of elements of different ranks;

- *subordination* – to the structural forms and functions of biodiversity protection, migration routes and species distribution;

- *traditional forms of management*, maintenance of ecological homeostasis;

- *maximization* – inclusion of the existing nature reserve network into the ecological network to the extent possible;

- *multifunctionality* – inclusion of semi-natural, degraded, and deserving of restoration ecosystems, as well as areas of traditional farming, fishing, hunting, etc. in the ecological network along with natural ecosystems;

- *reliability* – provides for stable and long-term counteraction to negative factors;

- *emergence* – associated with a holistic, holistic approach to the study of any system.

In addition to the above-mentioned approaches, there are scientific principles for organizing a network of environmental objects of different levels and purposes.

Biogeocenotic (evolutionary). The protected area should ensure the preservation of favorable environmental conditions necessary for the development of all existing forms of living organisms in natural landscapes that have arisen in the

course of evolution and are the basis for the normal functioning of ecosystems of all biomes of the planet.

Historical. Protected natural ecosystems and protected landscapes should serve as a kind of benchmark for the historical process of the formation of living and non-living nature both on a regional and broad biogeographic scale. Particular attention should be paid to the protection of ecosystems with relict flora and fauna, unique refugia of vegetation, preservation of phytocoenoses of interest from the point of view of the history of biogeocenotic cover formation, as well as geological outcrops and other objects of inanimate nature valuable for studying the geological past of the Earth.

Zonal and geographical. It is necessary that the ecological network reflects latitudinal and meridional, and in mountainous areas - altitudinal patterns of distribution of natural ecosystems. Ecosystems with endemic species of animals and plants, species at the edge of their range and altitudinal distribution in mountainous areas, as well as biogeographically interesting azonal ecosystems should be protected.

Ecological. The reserve regime should ensure the protection of natural ecosystems that are valuable for science and have been formed in different environmental conditions. In order to ensure the ecological framework of the territories and maintain ecological balance, ecosystems that perform an important ecological function should be covered by the environmental protection regime.

Resource and economic. The NRF should include ecosystems that are of practical importance for the development of forestry, water, fisheries and other sectors of the economy; for example, highly productive forests or artificial forest plantations that are valuable in genetic and breeding terms, phytocoenoses, ecosystems that contribute to the enrichment of the gene pool of ecosystems and cultural landscapes.

Social. The ecological network, through a regulated environmental protection regime, should contribute to the preservation of natural landscapes that are valuable in terms of recreation and balneology to meet the needs of the population, taking

into account demographic development, urbanization and industrialization in the country.

Research. The reserve regime should cover natural landscapes in different zones suitable for conducting field studies of the structural organization of ecosystems of different biomes now and in the future. It is necessary to preserve reference ecosystems for monitoring natural processes, studying the functioning of the biosphere as a result of long-term anthropogenic impact, and developing scientific foundations for its optimization. The eco-network should contribute to the preservation of artificially created protected areas (arboretums, botanical gardens, open-air zoos) that are of scientific and research importance.

The didactic principle is to establish a protective regime on protected natural and anthropogenic objects and territories that have environmental and educational (upbringing) and natural cognitive (educational) significance.

Adherence to the above principles and approaches will allow us to identify spatial elements and form a functionally effective ecological network. After all, the concept of creating an ecological network that uses the above principles and approaches involves the creation of a single, functionally integral and territorially continuous system of natural or quasi-natural areas that would ensure ecological balance, stable existence of the biosphere and balanced development of society.

4.2 Pan-European Ecological Network

The Pan-European Ecological Network as a physical network of natural or semi-natural areas of European importance is the main direction of implementation of the **European Strategy for the Conservation of Biological and Landscape Diversity**, which was approved at the Conference of European Ministers of the Environment in Sofia in 1995.

The program of its creation provides for:

- development of criteria for the identification of key areas, ecoregions, restoration areas and buffer zones, taking into account the biogeographical zones of Europe;

- selection of ecosystems, habitat types (ecotopes), species and landscapes of European importance;
- identification of specific sites for the conservation, improvement or restoration of ecosystems, habitats, species and their genetic diversity, as well as landscapes of European importance;
- development of guidelines (directives) that will ensure the most consistent and effective implementation of measures to create an ecological network.

The Pan-European Strategy also formulates the main objectives of the ecological network: 1) preservation of the entire complex of ecosystems, habitats, species and their genetic diversity, as well as landscapes of European importance; 2) provision of sufficient space for species conservation; 3) creation of the necessary conditions for species dispersal and migration; 4) ensuring the restoration of components of key ecosystems that have been destroyed; 5) protection of systems from potential negative factors.

The Pan-European ecological network is created on the basis of the following basic principles:

- the ecological network model with its key elements in the form of natural cores, ecological (natural) corridors and buffer zones is a natural framework for the conservation and restoration of biodiversity;
- the architecture of the ecological network model should be determined by the natural conditions and administrative circumstances of different countries and regions;
- the ecological network should be multi-level;
- the ecological network model should become a dynamic tool for the development and implementation of wildlife conservation policy;
- the idea of the ecological network should link the development of the system of protected areas with socio-economic development.

The Pan-European ecological network will include the following elements:

- *natural cores* or foci (key areas) for the conservation of ecosystems, habitats, plant and animal species, and landscapes of European importance. The natural

cores of the Pan-European Ecological Network include only those natural areas that meet the criteria of international (global, European and regional) conventions and agreements and are recognized by them (nature reserves, protected areas of national nature parks and biosphere reserves);

- *ecological corridors* or transition zones to ensure interconnections between natural cores – elements of defragmentation of natural areas and migration routes at the same time. The function of eco-corridors in national nature parks and biosphere reserves is performed by elongated natural elements: rivers and protective forest strips, mountainous strips, etc. in the economic zone and the zone of anthropogenic landscapes, respectively;
- *buffer zones*, which help to strengthen the network and protect it from the impact of negative external factors. Buffer zones include protection zones around nature reserves, recreational zones in national nature parks, and buffer zones in biosphere reserves (reserves);
- *restoration areas*, where there is a need to restore damaged elements of ecosystems, habitats and landscapes of European importance or to completely restore some areas.

The integrity of the network is ensured through the creation of continuous eco-corridors or intermittent "transition zones" that facilitate the dispersal or migration of species between natural areas.

The natural centers of the ecological network include nature protection and nature reserve areas with their buffer zones and eco-corridors.

4.3 General provisions for the establishment of a national ecological network

The legal basis for the creation of the ecological network in Ukraine was laid down in the Law of Ukraine "On Environmental Protection" (1991), which states that natural areas and objects subject to special protection form a single territorial system and include territories and objects of protected areas, resort and health resort,

recreational, water protection, field protection types of territories and objects defined by the legislation of Ukraine.

Relations related to the formation, preservation and use of the ecological network are regulated by the laws of Ukraine: "On the Nature Reserve Fund of Ukraine", "On the Ecological Network of Ukraine", "On Flora", "On Fauna", "On the Red Book of Ukraine", "On Protection of Cultural Heritage", "On Planning and Development of Territories", Land, Water, Forest Codes of Ukraine, the Subsoil Code, and international environmental legislation.

The main provisions on the formation of the ecological network of Ukraine are set out **in the Law of Ukraine "On the National Program for the Formation of the National Ecological Network of Ukraine for 2000–2015"** and **the Law of Ukraine "On the Ecological Network of Ukraine".** The formation, preservation and use of the ecological network is carried out in accordance with the following basic *principles*:

- ensuring the integrity of ecosystem functions of the components of the ecological network;
- conservation and ecologically balanced use of natural resources on the territory of the ecological network;
- stopping the loss of natural and semi-natural areas (occupied by plant communities of natural origin and complexes altered by human activity), expanding the area of the ecological network;
- providing state support and incentives for business entities to create territories and objects of the nature reserve fund and other areas subject to special protection on their lands, and to develop the ecological network;
- ensuring participation of citizens and their associations in the development of proposals and decision-making on the formation, preservation and use of the ecological network;
- ensuring the connection of the national ecological network with the ecological networks of neighboring countries that are part of the pan-European

ecological network, comprehensive development of international cooperation in this area;

- improving the structure of Ukraine's land by ensuring a scientifically sound correlation between different categories of land;
- systematic consideration of environmental, social and economic interests of society.

According to the Law of Ukraine "On the National Program for the Formation of the National Ecological Network of Ukraine for 2000–2015" (2002), the national ecological network of Ukraine includes territories and objects of the nature reserve fund, forests, water bodies, water protection zones and coastal protection strips of water bodies, other lands of the water fund, wetlands, hayfields, pastures, field protection forest strips, lands of health and recreational purposes, as well as lands of historical and cultural purpose, transport, defense and other lands of particular value for environmental protection, preservation of biological and landscape diversity, primarily species of plants and animals listed in the Red Book of Ukraine, plant communities listed in the Green Book of Ukraine.

The formation of an ecological network involves changes in the structure of the country's land fund by classifying (on the basis of environmental safety and economic feasibility) a portion of the land used for economic purposes as subject to special protection with the reproduction of the inherent diversity of natural landscapes.

In the territories that are part of the national ecological network, special measures should be taken to prevent the destruction or damage of natural landscapes, natural plant communities listed in the Green Book of Ukraine, preserve species of animals and plants listed in the Red Book of Ukraine, improve their habitats, and create appropriate conditions for the reproduction of rare biota in natural conditions and for their resettlement.

In 2004, the Law of Ukraine "On the Ecological Network" was adopted, which defines the structure, its constituent elements, principles of formation, preservation, use, management, and means of ensuring the ecological network. Special provisions

of this law include design, schemes and procedures for the formation, state monitoring and accounting of ecological network territories and objects.

The national ecological network includes territorial structures of national and local importance, which are determined by scientific, legal, technical, organizational, financial and economic criteria.

The structures of the national ecological network of national importance include:

- *natural regions*, where existing and future protected areas are concentrated. First of all, these are the regions of the Carpathians, Crimean Mountains, Donetsk Ridge, Azov Upland, Podillia Upland, Polissya, sources of small rivers, some mouths of large rivers, coastal and sea areas, continental shelf, etc;

- *natural corridors* – the main communication elements of the national ecological network, namely, latitudinal natural corridors that provide natural connections of a zonal nature: Polissia (forest), Galician-Slobozhansky (forest-steppe), South Ukrainian (steppe), as well as meridional natural corridors spatially limited by the valleys of large rivers – Dnipro, Danube, Dniester, Western Bug, Southern Bug, Siverskyi Donets – that unite water and floodplain landscapes, which are the migration routes for numerous species of plants and animals. A separate ecological corridor of international importance is formed by the chain of coastal and marine natural landscapes of the Azov and Black Seas, which surrounds the territory of Ukraine from the south.

The program aims to connect the national ecological network with the ecological networks of neighboring countries that are part of the European Ecological Network by creating common transboundary ecological network elements.

Thus, the formation of an ecological network is a tool for building a unified territorial system, which is created to improve conditions for the formation and restoration of the environment, increase the natural resource potential of the territory of Ukraine, preserve landscape and biodiversity, habitats and growth of valuable species of flora and fauna, genetic resources, and animal migration routes.

Control questions and tasks

1. Specify the prerequisites for the formation of the concept of ecological boundaries as an integrating measure for the protection and conservation of natural complexes.
2. What document provides for the implementation of the concept of the European Ecological Network?
3. Explain the main tasks of creating an ecological network.
4. What regulatory documents define the legal basis for the creation of a national ecological network?
5. Describe the main measures provided for the implementation of environmental functions of the national ecological network.
6. Specify the main structural elements of the national ecological network.
7. Describe the general approaches to the design process of the ecological network.
8. Specify the factors that affect the functional and planning structure of the ecological network.
9. Describe the socio-economic results that can be obtained within the framework of the concept of forming a national ecological network.
10. Describe the problems that slow down the process of formation and effective functioning of the ecological network.

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SECTION 5. RED DATA BOOKS IN THE SYSTEM OF BIODIVERSITY CONSERVATION

Outline

5.1 Creation of Red Data Books and their purpose.

5.2 Red Data Book of Ukraine.

5.3 The Green Book of Ukraine.

The problem of conservation of biodiversity is one of those that can be successfully solved only through a combination of efforts at the international, national and local levels. Special documents containing lists of protected biological species are of great importance: The IUCN Red List, the European Red List, and, for Ukraine, the Red Book of Ukraine and the Green Book.

5.1 Creation of Red Data Books and their purpose

The idea to create the Red Data Book belongs to the English zoologist, Professor Peter Scott. The purpose of the Red Data Book was to improve the protection of rare and endangered species of flora and fauna. The Red Data Book is also the basis for developing further actions aimed at protecting the listed species of animals and plants.

Red Data Books are official documents of non-governmental international and national administrative organizations that contain systematic information about plants and animals of the world or individual regions whose condition is of concern for their future.

The census of endangered species was launched in 1948 by the United Nations Organization (UN) under the International Union for Conservation of Nature. The organization's scientific activities are carried out through six Commissions in various areas: ecology; environmental planning; environmental education; national parks and protected areas; environmental policy, law and administration; and rare and endangered species.

The Commission on the Protection of Rare and Endangered Species was established in 1949 to create annotated lists of rare and endangered species. It was the "Lists of Rare and Endangered Species" that were initially included in the publication that was later called the "Red Data Book," and the color red was chosen not by chance – it is a symbol of danger, alarm and warning.

The first edition of the International Red List took 14 years to complete. As a result of the Commission's many years of work, the first edition of the book, the so-called register of rare and endangered species of wild plants and animals, was published in 1963; it was called the **Red Data Book**, had the form of a flip calendar and consisted of two volumes. Each species was given a separate page, and the book was printed on red paper, the color of warning. Since then, similar lists of endangered species have been published all over the world.

The species listed in the book were divided into two categories: *rare* and *endangered*.

Rare species are those that are not currently threatened with extinction, but are so few in number or live in such limited areas that they may disappear under unfavorable conditions.

Endangered species are those that are threatened with extinction and whose rescue is not possible without special measures.

The second edition of the International Red Data Book was published in 1966–1971 and developed a new classification of rare species. This edition consisted of three volumes – in addition to information on mammals and birds, it contained information on reptiles and amphibians. The first volume contained (for the first time!) information on rare plants.

At the same time, the Commission for the Protection of Endangered Species approved the creation of the Black List of Species (a list of irretrievable losses, published in 1973), a list of species that are known to be extinct. According to this list, it was stated that since 1600 alone, 118 species (subspecies) of mammals (e.g., the Turk, Steller's cow, wild horse – tarpan), 140 species of birds (wingless loon,

Carolina parrot, Labrador eider), and more than 230 species of other vertebrates, amphibians, and reptiles were endangered.

The International Red List has had several more editions. Today, the IUCN Red List exists in the form of electronic databases posted on the Internet. This information is updated annually and reviewed and analyzed every 4–5 years.

Categories of species in the IUCN red list:

I category – endangered species;

II category – extinct in the wild;

III category – a species on the critical edge of existence;

IV category – a species in a state of danger;

V category – vulnerable species;

VI category – a species close to the endangered status;

VII category – species in a state of emerging concern;

VIII category – the species is not well known;

IX category – the species is not sufficiently assessed.

The IUCN Red List for each species contains its scientific name, distribution in the European member states of the Economic Commission for Europe and outside Europe, and the global status of the species according to the IUCN species category classification.

Unlike national Red Data Books, the IUCN Red Data Book is not a regulatory document. That is, no state is obliged to fulfill its requirements. However, thanks to the organization's authority, it is still one of the most important documents in the field of protection of rare and endangered species. Its provisions are taken into account when creating national Red Data Books, which are the basis for many programs to save certain species.

According to the IUCN Species Survival Commission, about 20,000 species of higher plants are in need of protection today, and the World Biodiversity Conservation Monitoring Center estimates that 60,000 plant species and five thousand species of fauna are threatened with extinction, according to the IUCN Red List. In this context, it should be noted that Switzerland was one of the first countries

in the world to create the so-called "Blue List", which includes species from the National Red Data Book of rare species of the country, which, as a result of proper environmental policy and government activities, have stabilized their population composition and are now out of danger.

The IUCN Red List of Ukrainian flora includes mostly species of the seventh category.

European Red List. In 1990, Turkey finalized the draft of the **European Red List** of globally threatened animals and plants, and a year later in Finland, the European Economic Commission finally adopted the European Red List, as well as a number of recommendations to the governments of the member states on the application of this list.

The European Red List is a list of animal and plant taxa found in Europe that are threatened with global extinction.

It uses the following IUCN categories: Endangered, Threatened, Vulnerable, Rare, Uncertain, and Insufficiently Known. Today, it includes 60 species of mammals, 28 of birds, 37 of reptiles, 19 of amphibians, 38 of freshwater fish, 238 of invertebrates, and nearly 4,500 species of vascular plants. According to the Catalog of Rare Biodiversity, 110 species of vascular plants that are listed in the European Red List grow in nature reserves and national parks of Ukraine.

5.2 Red Book of Ukraine

The Red Data Book of Ukraine is an official state document that contains a list of rare and endangered species of flora and fauna within the territory of Ukraine, its continental shelf and exclusive (maritime) economic zone, as well as generalized information on the current status of these species of flora and fauna and measures for their conservation and reproduction.

The Red Data Book of Ukraine is a document that summarizes information on the current status of rare plants and animals in the country and serves as a basis for developing scientific and practical measures aimed at their protection, reproduction and rational use.

The Red Data Book of Ukraine is the basis for the development and implementation of programs (action plans) aimed at the protection and reproduction of rare and endangered species of flora and fauna listed in it.

The objects of the Red Data Book of Ukraine are rare and endangered species of flora and fauna that permanently or temporarily occur (grow) in natural conditions within the territory of Ukraine, its continental shelf and exclusive (maritime) economic zone.

The Red Data Book has a number of meanings:

- biological – it is intended for specialists and scientists;
- environmental protection – it provides for the development of measures to preserve animals and plants;
- egal – it establishes a special legal status of animal and plant species; determines increased criminal, administrative, material and moral liability.

Occupying less than 6% of Europe's area, Ukraine has approximately 35% of its biodiversity, which is due to the location of Ukraine at the crossroads of many natural zones and migration routes of many species of fauna.

The biota of Ukraine includes more than 70 thousand species, including more than 27 thousand species of flora and more than 45 thousand species of fauna. One of the measures to preserve this diversity of flora and fauna is to maintain the Red Data Book of Ukraine, which lists species that are endangered for various reasons.

When maintaining the Red Data Book of Ukraine, it is mandatory to map the distribution, determine the viability of populations, create national and regional lists, and establish the form and type of conservation regime. In protected areas, the status of populations is monitored, and a passport is issued for each population.

Depending on the status and degree of threat to populations of animal or plant species listed in the Red Data Book of Ukraine, they are divided into the following categories:

1. *Category 0 (endangered)* – species for which there is no information on their presence in Ukraine in nature or in specially created conditions;

2. *Category I (endangered)* – species that are threatened with extinction, the preservation of which is unlikely if the harmful effects of factors affecting their status continue;

3. *Category II (vulnerable)* – species that may be classified as "endangered" in the near future if the impact of factors that negatively affect their condition continues;

4. *Category III (rare)* – species whose populations are small and are not currently classified as endangered or vulnerable, although they are in danger;

5. *Category IV (uncertain)* – species that are known to be endangered, vulnerable or rare, but not yet assigned to any of these categories; including species that are more or less widespread in different regions of Ukraine;

6. *Category V (insufficiently known)* – species that require further research and cannot be assigned to any of the above categories due to the lack of necessary reliable information; including taxonomically critical species;

7. *Category VI (restored)* – species whose populations, due to the measures taken to protect them, are not of concern, but are not subject to use and require constant monitoring.

It should be noted that the categorization adopted in the Red Data Book of Ukraine does not coincide with the international IUCN categorization.

The Red Data Book of Ukraine contains the following information about each of the species of animals and plants listed in it: Ukrainian and Latin names, category, distribution, main habitats, number in nature (including outside Ukraine), its changes, information on reproduction or captive breeding (culture), measures taken and to be taken for their protection, and sources of information. The book also contains distribution maps and photographs (drawings) of the listed species of animals and plants. The protection and reproduction of rare species is carried out by establishing a special legal status, monitoring the state of populations, creating protected areas at the site of plant localities, forming gene pools and special forms of species breeding. At the same time, extensive legal work is underway to clarify the importance of rare species. The collection of rare species is allowed only in

certain cases – for reproduction and cultivation, scientific research, etc. Such requests are possible only from scientific institutions and are authorized by the Ministry of Ecology and Natural Resources of Ukraine.

Persons who violate the rules of protection and conditions for the reproduction of rare species listed in the Red Data Book are held administratively, financially or criminally liable in accordance with the legislation of Ukraine. The amount of compensation for these violations is determined according to the rates approved by the Cabinet of Ministers of Ukraine.

The form for reporting rare species of plants and animals is determined by the National Commission on the Red Data Book of Ukraine. The Commission includes leading scientists from the National Academy of Sciences of Ukraine and other institutions, including the Ministry of Ecology and Natural Resources of Ukraine.

The basis for listing a species in the Red Data Book is information about its number and dynamics in natural communities. All individuals or organizations can submit proposals for the Red Data Book. The National Commission on the Red Data Book of Ukraine carries out the expert review of the proposal, and the relevant decision is made by the Ministry of Ecology and Natural Resources of Ukraine. If the threat of extinction has ceased to threaten the species (for example, as a result of environmental protection measures), the same National Commission on the Red Data Book of Ukraine submits a proposal for its removal from the Red Data Book.

The Ministry of Ecology and Natural Resources of Ukraine is responsible for maintaining the Red Data Book, i.e. monitoring its regular (once every 10 years) reissue. All expenses for the Red Data Book are covered by the state budget of Ukraine.

5.3 The Green Book of Ukraine

The current pace of denaturalization of natural landscapes has led to an impoverishment of not only species composition but also phytocoenotic diversity. Along with the preservation of the phytogenetic gene pool, the protection of the phytocoenosis as a functional, primarily energy, basis of the biosphere is now a priority. Therefore, it is extremely necessary to change the emphasis in

environmental protection activities from preserving the phytogenetic gene pool to preserving the phytocoenosis. This also follows from the current state of the biosphere, the principal feature of which is that its functional state is deteriorating at a much higher rate than its genetic one. The protection of natural vegetation solves a threefold eco-problem: preservation of the phytocoenosis fund, phytogenetic fund and ecosystems in which phytocoenoses develop.

Thus, thanks to the development of a systemic environmental protection concept, arguments have emerged regarding the need to protect the rare phytocoenosis, which is the purpose of the Green Book of Ukraine. In methodological terms, its principal advantage over the Red Book is its systematic approach, and in practical terms, it preserves both the genetic and functional foundations of the biosphere.

In the current Ukrainian legal framework for the natural environment, the status of the Green Book is determined by the **Law of Ukraine "On Flora" (1999) and the Regulation on the Green Book of Ukraine,** approved by the Cabinet of Ministers of August 29, 2002, № 1286.

The scientific significance of the Green Book of Ukraine is that it contains information on relict, endemic and other rare communities. Thus, it creates prerequisites for the study of historical stages of vegetation development and clarification of the laws of formation of its various types.

By the nature of their distribution, the groups are distributed as follows: most of them (65) have the northern limit of distribution on the territory of Ukraine, 36 are located on the eastern border of the range, 35 – on the southern border, 12 – on the western border. Communities dominated by endemic species that do not occur outside Ukraine are represented by 9 syntaxa.

The Green Book of Ukraine contains information on the current state of rare plant communities and measures for their conservation and scientifically based reproduction. Each article about a community is accompanied by the following information:

1. *The name of the community* (in Ukrainian and Latin).

2. *Synphytosozological index, class, category, status* – indicators of the rarity of the plant community. *According to the status, phytocoenoses are divided into endangered, threatened, vulnerable, rare, uncertain and typical phytocoenoses*. These indicators are decisive in calculating fines for damage to plant communities and establishing a system of protection regimes for them; for example, some endangered communities require absolute protection, and if regulatory measures are appropriate, they must be qualified by scientific justification.

3. *Distribution in Ukraine*. Botanical and geographical or physiographic regions with specified geographical names of specific habitats of rare plant communities are indicated.

4. *Environmental conditions*. The main ecological parameters of the communities' habitats are indicated and their features are noted.

5. *Habitat.* The information on the plant community belonging to the biotope according to the Corine ecosystem classification and the list of habitats according to the Bern Convention is given.

6. *Phytocoenotic significance*. The types of association of populations of dominant species in the phytocoenosis are indicated. A unique type of association is characterized by a combination of dominants that differ from typical zonal dominants by genetic, phenotypic and other characteristics, as well as ecological affiliation. A rare type of association is characterized by a combination of dominants, where one of them is either relict, endemic or a species from the Red Data Book of Ukraine.

7. *Phytosozological significance*. The phytocoenosis is characterized in terms of the presence of dominants that are legally protected at the continental or national levels, or the presence of value (historical, ecological, etc.) of the phytocoenosis as a whole.

8. *Botanical and geographical significance*. The distribution of dominant species of phytocoenosis on the territory of Ukraine is indicated.

9. *The coenotic structure and floristic core*. The characteristic of vertical and horizontal structures of phytocoenoses and floristic core is given, which is

expressed in the main plant species that play a decisive role in the formation of phytocoenosis.

10. *Restoration potential*. The ability of the dominants to recover naturally in specific environmental conditions and depending on their biological characteristics is indicated.

11. *Protection regime*. Depending on the dynamic state of phytocoenoses, ecological conditions, anthropotolerance and the degree of their disturbance, it is proposed to determine a system of sozotechnical measures that would allow to support the functioning of phytocoenoses to the maximum extent.

12. *Motives and provision of protection*. The motives for protection are determined, the territories of the Nature Reserve Fund of Ukraine in which the phytocoenosis is preserved are indicated, or it is noted that the phytocoenosis is not protected or exploited.

13. *Biotechnical and sozotechnical recommendations*. Suggestions for the best conservation of rare phytocoenoses, improvement, reproduction or rational use of them, constant monitoring of their condition, the need for scientific research to develop additional scientific basis for the protection of these phytocoenoses and improvement of their habitats and establishing their legal status are indicated.

14. *Sources of information.* A list of Reference and other bibliographic sources from which information on this rare phytocoenosis can be obtained is given.

15. *Cartographic scheme*. The topographical basis of the territory of Ukraine with different symbols of the rare phytocoenosis distribution is given. The hydrographic network and names of regional centers are shown on this basis.

The Regulation on the Green Data Book of Ukraine defines five categories of plant communities that require protection and inclusion in the Green Data Book of Ukraine, namely:

- indigenous plant communities, which are dominated by plant species listed in the Red Book of Ukraine, as well as relict and endemic plant species;

- indigenous plant communities, the composition of which is determined by typical plant species that grow at the limit of their range or high distribution and tend to reduce their vital potential;
- plant communities that are not related to the natural zone (swamps, meadows, water bodies, etc.) and require protection for botanical and geographical reasons;
- plant communities interconnected with endangered species of fauna;
- plant communities formed by plant species that were widespread in the past but have become rare under the influence of anthropogenic or natural factors.

Thus, the Green Book is the basis for developing conservation measures for the conservation, reproduction and use of the listed natural plant communities. The protection of these communities is aimed at preserving their coenotic structure, populations of rare plant species and habitat conditions.

Control questions and tasks

1. Explain the main idea behind the establishment of the Red Book.
2. What is the purpose of the European Red List?
3. Describe the categories of species of the IUCN Red List.
4. Define the concept of "Red Book of Ukraine" and indicate its objects.
5. Explain the criteria for selecting species for inclusion in the Red Data Book of Ukraine.
6. Indicate the differences between the IUCN Red List, the European Red List and the Red Data Book of Ukraine.
7. Explain the prerequisites for the creation of the Green Book of Ukraine.
8. What regulatory documents determine the status and main provisions of the Green Book of Ukraine?
9. On what grounds in the Green Book of Ukraine characterized rare plant communities?
10. What plant communities can be listed in the Green Book of Ukraine?

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SECTION 6. NATURE AND BIOSPHERE RESERVES

Outline

6.1 Nature reserves: status, tasks and peculiarities of protection.

6.2 Biosphere reserves: status, tasks, territory structure and management features.

6.3 Peculiarities of nature reserves in Ukraine.

Over the years, a network of protected areas has been formed on the territory of Ukraine, which has been reliably based on the fundamental theoretical developments of a whole galaxy of prominent environmental scientists. A large number of scientific papers are devoted to the idea of nature reserves, in particular, thanks to the works of V.V. Dokuchaev, M.F. Reimers, F.R. Stilmark and many other scientists, the basic principles of creation and operation of nature reserves were formed and gradually, based on the vast practical experience gained, the priorities for the development of these territories were determined.

According to scientists, nature should be studied in nature reserves, which is preserved in complete inviolability, to identify its laws, knowledge of which is necessary for the reasonable use of natural resources. This idea has been a "red thread" throughout the history of nature reserves, but at different times, views on the tasks of nature reserves have changed. The latter was due to both the destruction of the country's nature and the change in scientific views on nature protection, including under the influence of ideology and economic policy.

According to the Law of Ukraine "On the Nature Reserve Fund of Ukraine," there are two types of reserves in Ukraine: *natural and biosphere reserves.*

6.1 Nature reserves: status, tasks and peculiarities of protection

Nature reserves are nature protection, scientific and research institutions of national importance created with the aim of preserving in their natural state typical or unique for a given landscape zone natural complexes with the entirety of their components, studying natural processes and phenomena occurring in them,

developing scientific principles of environmental protection, efficient use of natural resources and environmental safety.

Under current legislation, land and water areas with all natural resources are completely withdrawn from economic use and granted to nature reserves for unlimited (permanent) use.

The main functions of nature reserves are: *nature protection* (promoting the conservation of biological, ecosystem and landscape diversity) and *scientific* (studying the functioning of ecosystems, conducting scientific observations of natural processes).

The main tasks of nature reserves are to preserve natural complexes and objects on their territory, conduct scientific research and observation of the state of the environment, develop environmental recommendations based on them, disseminate environmental knowledge, and assist in the training of scientific personnel and specialists in the field of environmental protection and nature conservation.

The nature reserves are also responsible for coordinating and conducting scientific research in the territories of nature reserves, natural monuments, and protected tracts in the region.

In order for a nature reserve to be able to fulfill its functions and tasks, its territory must meet certain requirements. Ideal for the creation of nature reserves are natural-territorial complexes that are unaffected by anthropogenic impact and unique in their scientific and natural significance. Such complexes are considered to be the benchmarks of nature. However, due to the global scale of humanity's impact on the Earth's nature, there are virtually no such untouched areas left today. Therefore, in practice, nature reserves preserve ecosystems that meet certain properties: unoccupied by human economic activity or a minimal degree of damage to natural territorial complexes, vulnerability and the possibility of loss (replacement of natural communities by anthropogenic ones), representativeness (typicality), uniqueness, rarity (presence of rare species, groups), richness and diversity of species, life forms, functional groups, faunal complexes, gene pool, etc.

Nature reserves are organized in areas of exceptional (international and national) environmental and scientific importance. This is determined by the fact that the area is home to habitats of rare species of plants and animals (i.e., the most valuable and rare species, the threat of extinction of which is very high; these are mainly species listed in the Red Book of Ukraine, world and European "red" lists, relict and endemic species, etc.) Today, the importance of areas with typical and rare plant communities listed in the Green Book of Ukraine, as well as other sites of significant scientific importance, such as virgin forests, native steppes, unique marshes, etc. is exceptional.

The territory of a nature reserve should be characterized by representativeness, i.e., it should be typical for a certain region in terms of geological, geomorphological structure, soil cover and reflect the main floristic, faunal, phytocoenotic, botanical and geographical features of this region.

The size of the reserve, the configuration of its borders, its location in relation to transport systems and large cities, and the population density in the region are of great importance for the organization and functioning of the reserve. These factors determine the accessibility of the territory for visitors, the threat of invasion and poaching. The nature of the past use of the reserve's territory, the nature of management in the areas surrounding the reserve, and the degree of anthropogenic transformation are also important. It is desirable that the lands on which the reserve is created are included in economic circulation as little as possible (no arable land, mining sites, industrial facilities, recreational areas, etc.) It is also desirable that the territory of the reserve is delineated by natural boundaries (e.g., the coastline of rivers and other water bodies, mountain ranges, gorges, etc.)

Requirements for the protection of natural complexes and objects of nature reserves.

On the territory of nature reserves, it is *prohibited* to carry out any economic and other activities that contradict the purpose of the reserve, disrupt the natural development of processes and phenomena or pose a threat of harmful impact on its natural complexes and objects, for example:

- construction of structures, roads, linear and other transport and communication facilities not related to the activities of nature reserves, construction of fires, arrangement of recreation areas, parking of vehicles, as well as passage and passage of unauthorized persons, and the driving of domestic animals, movement of motorized vehicles, except for public roads, logging, flying of airplanes and helicopters below 2000 meters above the ground, overcoming the sound barrier over the reserve territory by airplanes and other types of artificial noise impact exceeding the established standards;
- geological exploration, mining, disturbance of soil cover, hydrological and hydrochemical regimes, destruction of geological outcrops, use of chemicals, all types of forestry, as well as harvesting of fodder grasses, medicinal and other plants, flowers, seeds, reeds, grazing, catching and killing of wild animals, violation of their habitat, nesting, and other types of use of flora and fauna that lead to the disturbance of natural complexes;
- hunting, fishing, tourism, introduction of new species of animals and plants, carrying out activities aimed at increasing the number of certain species of animals beyond the permissible scientifically justified capacity of the land, collecting collection and other materials, except for materials necessary for scientific research.

In order to preserve and restore indigenous natural complexes, conduct research and perform other tasks in the nature reserve in accordance with the project of organization of its territory and protection of natural complexes, it is *allowed* to:

- carrying out restoration works on lands with disturbed indigenous natural complexes, as well as taking measures to prevent changes in the natural complexes of the reserve as a result of anthropogenic impact – restoration of the hydrological regime, preservation and restoration of historically developed plant communities, endangered species of plants and animals, etc;
- implementation of firefighting and sanitary measures that do not violate the reserve's regime; construction of buildings and other facilities necessary to fulfill the tasks assigned to the reserve in accordance with the established

procedure; collection of collection and other materials, performance of works envisaged by the plans of long-term stationary scientific research, and conducting environmental education and upbringing.

The project of organization of the territory of the nature reserve and protection of its natural complexes may provide for the allocation of land plots to meet the economic needs of the reserve and its employees in hayfields, grazing, gardens and fuel in accordance with the established standards.

In case of urgent need, at the request of the scientific and technical council of the nature reserve, with the permission of the central executive body in the field of environmental protection, measures aimed at protecting natural complexes, eliminating the consequences of accidents, natural disasters and other purposes not provided for in the project of organization of the territory of the nature reserve and protection of its natural complexes may be carried out on the territory of the nature reserve.

In order to eliminate the consequences of accidents and natural disasters that result in a direct threat to human life or destruction of protected natural complexes, particularly urgent measures are taken by decision of the management of the nature reserve.

6.2 Biosphere reserves: status, tasks, territory structure and management features

The category "biosphere reserve" was added to the structure of the Nature Reserve Fund of Ukraine in 1992 with the adoption of the Law of Ukraine "On the Nature Reserve Fund of Ukraine".

Biosphere reserves are environmental protection, research and development institutions of international importance created to preserve the most typical natural complexes of the biosphere in their natural state, to carry out background environmental monitoring, to study the environment and its changes under the influence of anthropogenic factors.

The creation of the World Network of Biosphere Reserves on a global scale was initiated in the 1970s by UNESCO and IUCN. The creation of such a network is the goal of UNESCO's international program "Man and the Biosphere" and is associated with the global impact of human activity on the biosphere and the need to create a special system of environmental monitoring of the man-made and natural environment. Today, there are more than 300 biosphere reserves in the world.

Biosphere reserves are created on the basis of nature reserves, national parks with the inclusion of territories and objects of the nature reserve fund of other categories and other lands and are included in the established order in the *World Global Network of Biosphere Reserves.*

Biosphere reserves face important scientific tasks of fundamental and applied nature: environmental, economic and social.

Ecological tasks include preservation of biological and landscape diversity, monitoring of natural processes and anthropogenic impact.

Economic objectives are to develop environmentally sound management methods based on advanced technologies that increase the efficiency of natural resource use with minimal environmental damage. For example, in the steppe zone, such tasks include preserving humus in the soil, preventing secondary salinization, salinity, flooding, and protection against wind erosion. For the landscapes of the broadleaf forest zone, this means increasing the biological sustainability and productivity of forest ecosystems. Improving their water and soil protection functions, promoting natural regeneration.

Social objectives are to preserve the cultural and historical values and cultural heritage of the region as a whole, to promote environmental education and environmental education of the general population, and to improve the skills of specialists in various fields of nature protection.

For biosphere reserves, a differentiated regime of protection, reproduction and use of natural complexes is established in accordance with functional zoning:

protected zone – includes territories intended for the conservation and restoration of the most valuable natural and minimally disturbed by anthropogenic

factors natural complexes, the gene pool of flora and fauna; its regime is determined in accordance with the requirements established for nature reserves;

buffer zone – includes territories allocated in order to prevent negative impact on the protected area of economic activity in the adjacent territories; its regime is determined in accordance with the requirements established for the protection zones of nature reserves;

zone of anthropogenic landscapes – includes territories of traditional land use, forestry, water use, places of settlement, recreation and other types of economic activity; hunting is prohibited in it.

Within the territory of biosphere reserves, zones of regulated reserve regime may be allocated, which include regional landscape parks, nature reserves, and protected tracts in compliance with the requirements for their protection established by the Law of Ukraine "On the Nature Reserve Fund of Ukraine".

The zoning of the territory of biosphere reserves is carried out in accordance with the project of organization of the territory of the biosphere reserve and protection of its natural complexes.

The project for the organization of the biosphere reserve territory and protection of its natural complexes defines and justifies measures for environmental protection, research, recreation, and economic activities in accordance with the law and international agreements.

Scientific research, monitoring of the state of the environment and other activities of biosphere reserves are carried out in accordance with international programs.

In Ukraine, biosphere reserves include the F.E. Falz-Fein Askania-Nova, Black Sea, Carpathian, and Danube biosphere reserves.

Table 6.1 presents the structure of the number and area of nature and biosphere reserves in Ukraine, according to the Ministry of Ecology and Natural Resources of Ukraine as of January 1, 2011 year.

Table 6.1 **Structure of the number and area of nature and biosphere reserves in Ukraine reserves of Ukraine**

Category	Quantity		Area	
	objects	percentage of the total number	thousand hectares	percentage of the total area
Reserves:				
natural	19	0,2	205,3	5,5
biosphere	4	0,1	250,9	6,7

According to the State Statistics Committee of Ukraine, about 3 million people have visited biosphere reserves and national nature parks annually in recent years. Biosphere reserves are visited by more than 200 thousand people a year. The largest number of visitors is recorded in the Askania-Nova Biosphere Reserve – about 141 thousand people.

6.3 Peculiarities of nature reserves in Ukraine

The activity of the reserves was based on the idea of preserving natural standards and the least disturbed ecosystems. However, this approach objectively reflected the state of natural ecosystems only in Russia, where the country's vast territory, extremely low population density, and well-preserved pagan traditions of the indigenous peoples of certain regions allowed for the establishment of full-fledged and self-sufficient nature reserves that fully met the concept of a natural standard. Classic examples of such reserves are the Kronotsky, Altai, and many others. Certain ethnic and cultural traditions also played an important role.

Ukraine belongs to the so-called "anciently developed" territories, where natural ecosystems have been subjected to increasing anthropogenic pressure since the Late Paleolithic era. This process has especially intensified in the last 3 to 5 thousand years, as some historians associate even the decline of the Trypillian culture with extensive nature-destroying agriculture, which led to a deep ecological crisis.

And if we analyze in detail the state of protected areas in Ukraine, practically none of them (perhaps with a few exceptions in certain areas of individual reserves) can be a natural benchmark. For example, in the recent historical past, it was Chapelsky Pid that was the main camp of the Chumaks, as it had the longest preserved lush pastures for oxen and horses. Today it is the territory of the oldest Ukrainian reserve Askania-Nova.

Almost all of Ukraine's nature reserves and a large part of its biosphere reserves can only conditionally be called natural standards, because their territories were transformed by human activity to a greater or lesser extent before they were protected. After these territories were declared protected and direct anthropogenic pressure was removed from them, dramatic changes in existing ecosystems were provoked, which were exacerbated by insecurity from surrounding anthropogenic landscapes, insufficient area for self-regulation, and often insufficient or even absent unifying elements.

By removing large herbivores (mammoths, bison, tarantulas, antelopes) and then large shrews (including marmots), which actively influenced the formation of landscapes, at different historical times, humans not only provoked the degradation of natural ecosystems and a decrease in biodiversity, but also initiated new types of succession that were previously unknown in nature and created a lot of semi-regulated or artificial ecosystems. With few exceptions, such ecosystems became the basis for the creation of nature reserves in Ukraine.

But the century-long experience of nature reserves has provided extremely valuable scientific and practical experience. It has become clear that against the background of global biodiversity depletion, these territories can only serve as temporary refugia for the survival of populations of individual species or species complexes, but are by no means self-sufficient, long-term, full-fledged natural ecosystems. The idea of "restoring indigenous (climax) ecosystems in nature reserves" is equally fantastic. If only because even experts do not have a consensus on what constitutes a natural (indigenous) ecosystem for a particular territory.

The above factors have created a paradoxical situation in many reserves, where certain species, or even species complexes, have disappeared and are disappearing in protected areas, but feel fine in adjacent areas with moderate anthropogenic pressure. At the same time, succession processes lead to further simplification and impoverishment of protected ecosystems, which contradicts the basic concepts of conservation.

That is why the eternal dilemmas for Ukrainian (and most European) nature reserves: to cut – not to cut, to mow – not to mow, to burn – not to burn, to graze – not to graze *have two solutions*.

The first is to develop for each reserve, based on the results of long-term monitoring, a scientifically sound management plan projected for the next 25 to 50 years, which should clearly define compensatory mechanisms for leveling the anthropogenic pressure. In other words, to take over the imitation of the factors that led to the emergence of these ecosystems before the reserve.

The first way involves the artificial conservation of protected ecosystems in order to maintain the existing biodiversity. This is feasible, but quite dangerous, as society is not immune to radical changes in views on the principles of nature protection and conservation in particular. At the same time, no one can predict the level of sustainability of an artificially maintained ecosystem, which, in turn, is a direct threat to the existence of nature reserves.

The second is the development of a management plan, according to which, as succession processes progress, once lost elements (or their analogues) are gradually "built into" protected ecosystems at the level of species or species complexes that can take over certain regulatory functions in the current artificially maintained ecosystems.

The second way is also risky, because it is not always possible to predict the reaction of an established ecosystem to the return of a once-lost species (or complex of species), but it is more natural and allows nature to maximize the use of reproduction mechanisms, and, accordingly, a unique opportunity to study these processes without compromising the maintenance of biodiversity.

As a special public product, nature reserves cannot stay away from the socio-economic and political processes taking place in the post-Soviet space.

For example, in some Central Asian countries, the idea of nature reserves did not find support among the new political elites, which led to the elimination of a number of once beautiful reserves. Most nature reserves in the Baltic states have been integrated into European environmental protection structures and have been granted the status of national nature parks.

The most conservative traditions of conservation, classical in Soviet times, have been preserved in Russia, Kazakhstan, Belarus, and Ukraine, but in these countries, too, public preference has recently been given to the Euro-American environmental model, namely the development of a network of national nature parks.

Thus, we can state the fact that the classical reserve is currently experiencing a serious social and scientific crisis. On the one hand, it is increasingly difficult to explain to the public the importance of the scientific, informational and economic resources of nature reserves, which is the main obstacle to justifying the feasibility of creating new reserves under current legislation. On the other hand, contradictions in the performance of their individual functions are increasingly felt in the reserves themselves.

It is extremely dangerous for nature reserves to blindly copy the Euro-American principle of wildlife protection, the main form of which is a national nature park (NNP), because nature reserves and NNPs differ both in idea and in essence. The creation of any reserve is based on the idea of preserving nature in all its manifestations, while a national nature park is largely a form of wildlife exploitation through recreation.

Since the late 1980s, the world's leading ecologists have been constantly sounding the alarm about the degradation of NNPs caused by overloading the parks with visitors. In other words, the need for recreation (contemplation of wildlife) is growing with population growth and living standards, while the "amount" of wildlife suitable for such "contemplation" is steadily decreasing. And only a few NNPs, for

example, Kruger Park in South Africa, gigantic in size, with a global brand and decades of proven management, are able to earn money for their maintenance without obvious degradation of natural ecosystems.

The development of communication infrastructure and tourism in Ukraine is only a matter of time, and therefore the ill-considered declaration of new territories as national nature parks, especially in remote regions with remnants of wildlife, actually begins the degradation of that nature through increased recreation.

Repeated attempts at the state and legislative levels to revise their status in order to include them in the list of NNPs, as happened in many post-Soviet countries, are extremely dangerous for nature reserves. After all, zoning the territory of small reserves means their complete collapse.

The historical component and development of Ukraine's territory have also left their mark on the size of the reserves. The vast majority of them cover an area not exceeding 10,000 hectares. Thus, populations of large animal species such as bison, bear, elk, wolf, and lynx are not even theoretically capable of surviving for a long time within a protected area. For example, scientists estimate that within the Kaniv Nature Reserve there can live 0.3 wolves.

Even bigger problems exist in cluster-type reserves, where entire species complexes are threatened with extinction. For such nature reserves, ordinary fires or other natural disasters can be a complete collapse, causing complete and often irreversible destruction of ecosystems.

According to scientists, nature reserves need to integrate into new socio-economic processes without losing their basic functions.

This can be done through the implementation of the project "Each region has its own reserve, each reserve is the natural core of the region".

This project involves two stages of implementation. *The first* stage is the expansion of the territory of the reserves to scientifically justified self-sufficient boundaries in the form of cluster-type protected cores. *The second* stage is the creation of a biosphere reserve on the basis of each nature reserve, through further

expansion, where the protected cores should be united by other zones (buffer, traditional management, etc.).

This way allows us to comprehensively solve several problems at once.

1. While maintaining the highest status of protection of protected cores, the possibilities of long-term existence of populations at the expense of adjacent territories are dramatically expanded.

2. Many species have new opportunities to survive in areas of regulated anthropogenic pressure, as the diversity and mosaicism of ecosystems, including artificial ones, actually increases.

3. The strategy of human behavior throughout the entire territory of a biosphere reserve of this type is determined by the needs of exploiting scientific and information and environmental resources, not economic and recreational ones.

4. The existence and functioning of a biosphere reserve determines the strategy of sustainable and sustainable development of the entire region and, in fact, dictates and shapes environmental behavior in this region.

5. Nature reserves will be actively integrated into social processes without losing their core functions.

The existing biosphere reserves in Ukraine can provide invaluable assistance in forming a network of biosphere reserves, as they have extensive practical experience, well-developed management plans, and a large baggage of mistakes that newly created reserves should learn from.

An important component of this transformation of nature reserves is the scientific base formed by their centuries of activity. The implementation of this project requires a clearly articulated idea and strong lobbying of the interests of nature reserves at the legislative level. In this way, the reserves are able to determine the social and economic policy of many regions of Ukraine in the future.

Control questions and tasks

1. Describe the main functions and tasks of nature reserves.

2. Indicate what prerequisites are necessary for a nature reserve to be able to fulfill its functions and tasks?

3. Specify the types of economic activities that are prohibited on the territory of nature reserves.

4. Describe the focus of activities that are allowed in nature reserves in accordance with the project of organization of its territory and protection of natural complexes.

5. Define the concept of "biosphere reserve".

6. Describe the strategic goal of the World Network of Biosphere Reserves.

7. Specify the functional areas of biosphere reserves.

8. What are the fundamental differences between the natural and biosphere reserve?

9. Why the territory of Ukrainian nature reserves can be called natural standards?

10. Describe ways to improve the efficiency of nature reserves in Ukraine.

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SECTION 7. NATIONAL PARKS AND REGIONAL LANDSCAPE PARKS, NATURE RESERVES, NATUREL MONUMENTS, PROTECTED TRACTS

Outline

7.1. National parks: functions, tasks and main types.

7.2. Selection of the territory for the creation of a national park.

7.3. Functional zoning of national parks.

7.4. Features of the development of regional landscape parks in the world and Ukraine.

Until recently, the most common territorial form of nature protection in Ukraine was nature reserves, which were created with the aim of complete nature protection and used for scientific research, education and outreach. The "closed" nature of nature reserves caused, on the one hand, limited visits by the general public, and, on the other hand, a reduction in their network due to economic unprofitability. For this reason, the reserves were the epicenter of numerous conflicts (both open and perceived), and thus the satisfaction of social needs on their territory was out of the question.

The radical political and economic changes that have taken place in Ukraine in recent years have had a direct impact on changes in the field of nature conservation. The Law on Nature Reserves adopted in 1992 The Law "On the Nature Reserve Fund of Ukraine" envisaged the creation of new types of protected areas for recreational purposes, among which national nature parks (NNPs) occupy a leading place. National parks are the most popular type of protected area in the world. Their creation ensures both effective and stable protection of natural landscapes and the development of tourism and recreation, which is of great importance in solving economic and social problems in the regions.

7.1 National parks: functions, tasks and main types

Formation of the concept of national parks. The concept of national parks was formed in parallel with the development of environmental thinking. The definition of their main functions was influenced by:

- the formation of complex areas in the natural sciences in the early twentieth century – biogeographical, biogeochemical, ecological, and landscape. This led to a conscious transition from passive protection of individual species of flora and fauna to an understanding of an integrated approach to environmental protection as a necessary condition for preserving the entire species richness of the organic world. This could only be achieved through the organization of a network of large protected areas, among which national parks played a leading role;
- intensive industrial development and urbanization in the early twentieth century in Europe and North America, which caused the need for the general population to improve their health in the bosom of natural landscapes untouched by industrial influence. Therefore, national parks also faced social tasks, such as providing the urban population with the necessary recreational resources;
- the creation of national parks mostly under the auspices of the state, which emphasized the need for a state approach and control in their management and in the field of nature protection in general.

The term "national park" was first introduced into environmental practice by law in 1872, when the U.S. government created the world's first Yellowstone National Park for "the use and enjoyment of the people for all time in the form of a national park."

The unified international environmental definition of national parks was adopted much later – in 1969 in New Delhi at the General Assembly of the International Union for Conservation of Nature (IUCN).

According to the IUCN definition, a national park is a large area that covers one or more ecological systems unchanged or little changed by human exploitation

and settlement, characterized by various types of landscapes and richness of flora and fauna, as well as a variety of geomorphological systems that are particularly valuable from scientific, educational, upbringing and recreational points of view, or characterized by natural landscapes of high aesthetic value; where the state authorities of the country take appropriate measures to prevent.

National parks in the world play a major role in the conservation of nature in a broad sense, *so their main tasks* include:

- preservation of ecosystems as representative samples of the main biotic complexes of the planet;
- maintaining the ecological diversity of the natural environment;
- preservation of genetic resources of animals and plants;
- preservation of cultural heritage sites and objects;
- preservation of picturesque corners of nature;
- organization of tourism and recreation.

Main didactic tasks:

- ensuring environmental education of the population;
- conducting scientific research and observations of the natural environment.

Related tasks:

- maintaining ecological balance;
- preservation of ecosystem productivity;
- erosion control, runoff protection, etc.

Main types of national parks. The natural and socio-economic conditions of individual countries, as well as their conservation traditions, have led to the emergence of different types of national parks.

Semi-open national parks of state subordination of the North American type. They are organized to preserve unique natural phenomena, familiarize visitors with them, and provide short-term recreation in the respective recreational area. They include national parks organized in the United States and modeled after them in Canada, Australia, and some European countries.

Semi-open national parks of state subordination of the African type. They are created for the protection of little-disturbed ecosystems characterized by richness and species diversity of fauna. They are primarily of scientific, natural, environmental, educational, tourist and recreational importance.

Closed national parks of state subordination are of the Swiss-Swiss type. They are organized on the basis of biogeographically valuable state lands to protect unique natural ecosystems for scientific, environmental and educational purposes. Recreational use of park ecosystems is not allowed. Limited visits to the parks are allowed only along specially laid scientific trails to get acquainted with interesting ecosystems and their components.

Open national parks of the English type of recreational purpose. They are created mainly on private lands that are characterized by certain landscape, aesthetic and recreational values, as well as on the basis of state forest and other protected natural lands. In such parks, natural vegetation is protected, large-scale industrial construction is prohibited, but traditional forms of natural resource use by land users are preserved. These include English parks such as the Peak District, private Dutch and Belgian parks, and most English parks.

At the present stage, nature protection in Ukraine is a matter of political importance, and one of its primary tasks is to create a border of protected areas of various categories, among which national nature parks should occupy a leading place.

According to the definition of the Law of Ukraine "On the Nature Reserve Fund of Ukraine", national nature parks are nature protection, recreational, cultural, educational, research institutions of national importance, which are created for the purpose of preserving, reproducing and efficient use of natural complexes and objects of special nature protection, health, historical, cultural, scientific, educational and aesthetic value.

Multifunctionality is more typical for national parks than for other types of protected areas. They should perform the following functions:

- preservation of valuable natural, historical and cultural complexes and objects;
- creation of conditions for organized tourism, recreation and other types of recreational activities in natural conditions in compliance with the regime of protection of protected natural complexes and objects;
- conducting scientific research on natural complexes and their changes in the conditions of recreational use, developing scientific recommendations on environmental protection and efficient use of natural resources;
- conducting environmental education and training.

There is a complete analogy between the tasks faced by national parks at the international level and those that should be fulfilled by the national parks of Ukraine.

7.2 Selection of the territory for the creation of a national park

The selection of a national park territory is one of the most important issues. The fulfillment of the main functions assigned to the park on a national and international scale and the management strategy depend on the successful solution of this problem. The selection of a territory is a rather complicated process, during which controversial and difficult questions have to be solved: should a national park be created? What territory should be set aside for it? What should its area be? In solving them, one should take into account different views-ecological, economic, and political.

Let's consider the "ecological stage" of selecting a territory for a national park.

When selecting a territory, many methodological problems are solved, among which the main ones can be identified in general terms: 1) what should the national park protect – unique or typical? 2) how to determine the optimal size of the national park area and its configuration?

Problem 1. Although the idea of a national park has multiple functions and diverse goals, nature conservationists face the problem of determining the priority goal of creating a national park when selecting a territory. The crux of the matter is whether to give preference to the protection of the typical or the unique. Should a

national park be a reserve or a model? These issues can be effectively resolved by combining different approaches.

Biogeographical approach. This approach consists in selecting a territory for the creation of a national park that would cover the most typical natural systems (ecosystems or landscapes) of large natural regions. In this approach, the national park is seen as a benchmark.

The selection of territories from the standpoint of typicality or representativeness poses the following tasks:

- development of a system for dividing the surface (landscape or biogeographic shell) and identification of natural complexes that should be represented by at least one typical example;

- assessment of the existing fund of national parks and identification of natural complexes that have not yet been represented;

- filling in the gaps by organizing new national parks.

The selection of protected areas, including national parks, is based on the international parks, at the international level is based on the well-known Udvardy biogeographic land zoning system (Udvardy, 1975). It was developed in the 1970s as the basis for IUCN's work in assessing the representativeness of the existing network of protected areas, organizing information on the presence or absence of protected areas of a certain plan, and justifying the network of biosphere reserves. The Udvardi zoning system operates on a two-level system of taxonomic units: the regional level – biogeographic regions (faunal and floral kingdoms) and the typological level – types of biomes. Biogeographic provinces are located at the intersection of regional typological units.

Although the Udvardi scheme is the most prominent global zoning system for nature conservation, its application is limited. It can be used

- to illustrate and compare the state of play in the field of nature conservation;
- to identify states responsible for the conservation of representative geosystems;

- to identify international partner countries in environmental management responsible for the conservation of geosystems in the same regions.

However, it is difficult to use this scheme for the selection of territories at the national and regional levels. For this purpose, more detailed regional and national schemes of biogeographic or landscape zoning are created. They are used to more or less clearly localize the territory of a "potential" park.

The approach of *"species conservation"* is advisable to apply if the priority tasks of the national park are to preserve unique genetic resources and species of flora and fauna. Based on the results of the analysis of regional flora and fauna, the species that require priority protection are selected. These include:

- species that are essential for the full functioning of ecosystems and on which the productivity of other species depends;
- species that stabilize soil structure and fertility;
- species capable of changing their environment;
- species of special endurance in extreme environmental conditions;
- species used by humans for specific purposes – for pharmacology, etc;
- species of animals needed as models for the study of human behavior or psychology, such as great apes;
- wild relatives of cultivated plants and domestic animals, etc.

The selection of the territory based on the criteria of species availability is advisable for the following reasons:

- it is effective for identifying areas that require urgent protection;
- focusing on the main species of flora and fauna provides reliable indicators for determining the effectiveness of management;
- Emphasizing species conservation in site selection is a political point for public support. The local government and local population will be more likely to understand the need to protect rare species of animals or plants (especially those that are national relics) than the need to protect the typical vegetation of any biogeographic province;

- the list of plant or animal species in need of protection is the basis for the argumentation of the territory selection in the biogeographic approach.

Problem 2. When deciding on the size and design of protected areas, including national parks, the main provisions of the theory of "biogeographic islands" are used (see Theme 4). The theory of island biogeography, which was developed on the basis of the study of island species of fauna and flora, has led to important conclusions that should be taken into account in the strategy of site selection. According to this theory, small protected areas isolated by modified landscapes behave like islands. After such "isolation," they lose some native species until a new "impoverished" equilibrium is restored. The speed of this process depends on the size and biodiversity of the area and the extent to which it is remote from similar locations.

Establishing a link between the number of species and the area of "isolates" or "island" reserves has given rise to an assumption about the relative area where the fullest possible diversity of species in ecosystems can be preserved. According to it, each tenfold reduction in the area of the territory leads to the loss of 30% of the fauna of the isolate, and it is believed that only 50% of local species of flora and fauna can be preserved on 10% of the territory.

The main conclusions that follow from the theory of biogeographic islands and that are important for the selection of national parks and their management are as follows:

- it is desirable that protected areas be as large as possible and contain a surplus of flora and fauna species;

- national parks should have biogeographically appropriate boundaries

boundaries;

- it is desirable that the territory of national parks be a single one or create an archipelago of closely spaced reserves;

- protected areas should not be completely isolated from other natural areas and should be connected to them by "ecological corridors".

The theory of "biogeographical islands" has caused a lot of debate, which has not been resolved yet. This raised the question: what should be preferred – one large

reserve or an archipelago with a total area? It is difficult to make an unequivocal choice – one large or several small ones. A large one loses narrowly-specific species that live outside the reserves; a small one may not cover some species due to fragmented habitats. Both sizes of reserves have their advantages: a large one is more resistant to external influences, while a small one provides a greater diversity of species.

Landscape approach in the selection of the national park territory. Ukrainian geography has a more effective approach for selecting typical natural objects and systems in the creation of national parks, namely, the landscape approach. This approach makes it possible to distinguish natural systems (geosystems) based on internal interconnections and common genesis. Landscape mapping and physical and geographical zoning organize natural diversity by identifying geosystems of different orders, which can more reasonably define the boundaries of what is typical for nature conservation purposes than a simple combination of properties.

The protection of typical natural complexes is carried out by identifying geosystems of a certain rank and ensuring that each is represented in national parks. Thus, the task is reduced to conducting landscape mapping and allocating typological units of relatively homogeneous types of natural complexes with the highest taxon – the natural zone. However, regional differences in such a system are not very pronounced. The combination of landscape division of the country's territory with physical and geographical zoning makes it possible to divide the largest typological units into regional segments. Their homogeneity is manifested in the natural combination of heterogeneous natural complexes. If all types of natural complexes of all regions should be represented in national parks, then by integrating two comprehensive systems of division of the natural sphere – individual zoning and typological landscape mapping – it is possible to more reasonably select the territory of a national park.

Solving these problems on a national scale depends on the level of geographic, including landscape, research in different regions. The ecological stage in the

selection of the territory ends with a clear definition of the location of the national park, its size and shape, and localization of the boundaries.

7.3 Functional zoning of national parks

The fulfillment of diverse tasks by national parks and the combination of interests in nature protection, recreation and economic use can be achieved through the separation of different types of activities. The spatial ecologically justified delimitation of natural resource use regimes is the basis for the sustainable existence of natural geosystems and communities that need protection and create conditions for a full-fledged outdoor recreation. Successful fulfillment of the tasks of national parks is possible only if they are adequately zoned.

In general, the functional zone or management zone can be defined as a part of the national park territory that has natural or socio-economic boundaries, where a certain regime of nature protection and nature management is established and maintained in accordance with the goals and objectives of the national park.

The national parks of the world differ significantly in terms of the composition of zones, protection regime, size and other features. The type of national park determines the type of zoning, i.e. the structure of management zones. The main features of this structure may include: a set of zones with the appropriate nature of nature use and protection, their area, and mutual placement. The definition of management zones is so diverse that it is very difficult to unite and characterize them.

The International Union for Conservation of Nature has proposed a zoning scheme based on the experience of North American countries and the gradations of organized forms and regimes of protection adopted there. According to the IUCN recommendations, the following zones are distinguished in the national park:

- *a strict protection zone*, in which not only recreational and economic use is prohibited, but also interference with the course of natural processes;
- *a zone of untouched territories*, where the goal is to preserve nature in its original state; recreational visits are possible subject to certain rules of

conduct and the development of scattered non-motorized tourism; any activity is prohibited, except for some work that is necessary for the maintenance and control of visitors (design of tourist trails, observation points, etc.). This zone defines the national park itself, both in terms of content and space;

- *the "managed protection" zone*, where recreational activities are limited as required by management objectives that determine the nature of regulatory measures that support the stage of development, the desired landscape appearance, or ensure the conservation of certain communities and species;
- *tourist and administrative zone*, which includes service, recreation and educational expositions.

Most countries zoning national parks is guided by national legislation that defines the concept of protection regimes and forms of their territorial organization.

For example, in the national parks of the United States and Canada, the following management zones are allocated: lands that have preserved their natural character belong to the natural zone (special protection zone) and the zone of untouched areas; areas with cultural, historical or archaeological monuments – to the historical zone; areas with recreational facilities, roads, service facilities – to the service zone, or tourist-administrative zone; all other lands – private or public, used in agriculture or forestry, are a special use zone.

It is recommended that the tourist-administrative zone should not exceed 5% of the area, while the planning structure of the parks is simplified due to the wide spread of the *zone of untouched territories* (it can reach 90–95%).

The zones of national parks in Europe are extremely diverse, but according to the definitions and regimes of nature protection, there are generally 5 types of zones:

Absolutely protected (zone 1), where any use is prohibited and the regime of complete non-interference in the course of natural processes is maintained (on average, it occupies almost 20% of the park's area).

Zone of regulated recreational use (zone 2), which also prohibits interference with the natural dynamics of landscapes, but allows limited controlled recreational use without settlements (45% of the territory).

A restricted land use zone (zone 3), which must meet the goals of nature protection. Some traditional types of nature use are allowed here, as well as measures to be taken to avoid external negative impact (25% of the territory).

Zone of economic land use (Zone 4), where traditional management is preserved (10% of the territory).

Active management zone (zone 5), which includes farming areas of exceptional conservation value resulting from traditional management (e.g., long-term pastures and hayfields with high biodiversity – up to 0.5% of the area).

In accordance with the Law of Ukraine "On the Nature Reserve Fund of Ukraine", the national nature parks of Ukraine include:

- *a protected area* intended for the protection and restoration of the most valuable natural complexes, the regime of which meets the requirements established for nature reserves;
- *a zone of regulated recreation*, within which short-term recreation and health improvement of the population, inspection of especially picturesque and memorable places are carried out; in this zone it is allowed to arrange and equip tourist routes and ecological trails; here it is prohibited to cut down the forest of the main use, commercial fishing and hunting and other activities that may adversely affect the state of natural complexes and objects of the protected zone;
- *stationary recreation zone*, intended for accommodation of hotels, motels, campsites and other facilities for servicing park visitors;
- *economic zone*, within which economic activities aimed at fulfilling the park's objectives are allowed; it includes settlements, municipal facilities, as well as territories of other landowners and land users that are part of the park, where economic activities are carried out in compliance with general requirements for environmental protection.

In connection with the creation of new national parks in Ukraine, there is a need to know some limits of the ratio of areas of different zones, their optimal proportion. It should be noted that there are no regulations, as there is no need for

them. After all, zoning is not a mechanical process, but the result of a multi-component inventory of the territory's resources and the economic use of a larger region.

However, in accordance with the Guidelines for Protected Area Management (IUCN, 1994), in order for a national park to be recognized as a category II protected area, the area of the absolutely protected zone together with the area of intact areas (or their analogues in terms of protection regime) must occupy at least 75% of the national park area. If it is less than that, the national park is internationally classified as a category V protected landscape. In Europe, a relatively small number of countries have national parks of category II. For most national parks in Europe, including Ukraine, a transition period is required to transfer national parks from category V to category II (if this is a management task). During this period of time, there is a gradual reduction in the economic use of landscapes and they become fully protected.

The predominant function of nature reserves and national parks is environmental protection. That is why in many industrialized countries there is a need to organize a category of protected areas mainly for recreational purposes – natural parks. Such parks should meet the growing recreational needs of society. The natural park as a separate category of protected areas was allocated at the First World Congress on National Parks held in Seattle (USA) in 1962.

In recent decades, Ukraine has been actively creating regional landscape parks (RLPs), which are objects of category V – protection of landscapes and species according to the IUCN. This category has existed in the nature reserve fund since the early 1990s and is multifunctional, as it combines nature protection and recreation, preservation of historical and cultural values, and environmental education. The first regional landscape park in Ukraine, the Dniester Canyon, was established in Ternopil Oblast in 1990.

According to the Law of Ukraine "On the Nature Reserve Fund of Ukraine," regional landscape parks are environmental and recreational institutions of local or regional importance that are created to preserve typical or unique natural complexes

and objects in their natural state, as well as to provide conditions for organized recreation.

Regional landscape parks are organized with or without withdrawal of land plots, water and other natural objects from their owners or users. If there is a need to withdraw land plots, water and other natural objects for the needs of the regional landscape park, this is done in accordance with the procedure established by the legislation of Ukraine.

The main *functions* of the regional landscape park are: nature protection (preservation of landscape features and beauty, valuable natural complexes and objects); protection of cultural and historical monuments; recreation (organization of recreation and preservation of high recreational qualities of the environment); educational and cognitive (promotion of environmental education, fostering patriotic attitude to native nature, culture and history).

Regional landscape parks are entrusted with the following tasks:

- preservation of valuable natural, historical and cultural complexes and objects;
- creation of conditions for effective tourism, recreation and other types of recreational activities in natural conditions in compliance with the regime of protection of protected natural complexes and objects;
- promoting environmental education and awareness raising.

The suitability of a certain territory for the creation of an regional landscape park is determined by its functions and tasks and depends on the availability of natural, cultural and historical values, opportunities for environmental education, various types of recreation, and health improvement on their basis. It is desirable that the territory of the regional landscape park should include relatively unchanged natural complexes (typical or unique for a given region), natural ecotopes with valuable flora and fauna. The territory of the park should be "ecologically clean", i.e. characterized by the absence of significant pollution, not contain (and not be affected by) industries whose activities lead to deterioration and reduction of recreational, health and environmental values. The territory of an regional landscape

park should contain objects of cultural and historical heritage, and should be attractive and suitable for various types of recreation.

There are significant differences between national natural parks and regional landscape parks, and their networks complement and deepen each other. National nature park are categories of a higher protection rank, they are objects of national importance, have a stricter protection regime and play a greater role in biodiversity conservation. national nature park are also scientific research institutions. Unlike national nature park, as a rule, regional landscape parks are organized without seizing land plots from their owners or users. In addition, regional landscape park are not objects of state, as National nature park, but rather objects of local subordination and funding. Regional authorities approve a plan for the organization of the territory, protection and further operation of the park.

Unlike national nature parks, regional landscape parks can be created near large cities. It is in these conditions that the social functions of regional landscape park are most fully manifested, in particular, the possibility of meeting the needs of the urban population in places of recreation, the possibility of organizing cognitive and educational forms of recreation, etc. regional landscape park are a promising organizational form of protection of natural areas in regions with a high degree of economic development of landscapes.

To organize and regulate the use of multifunctional territories, they are zoned. The law clearly defines the functional zones of national nature park and states that zoning of regional landscape park can be carried out taking into account the requirements established for national nature park.

In a national nature park, the territories of the most valuable natural complexes are included in the protected zone, where the reserve regime is established. A regional landscape park, on the other hand, has a zone that includes the most valuable natural areas of the park. It is often called the "protected zone". Often, this zone includes territories of other nature reserve categories: nature reserves, natural monuments, and protected tracts. It is subject to the regime provided for the respective categories. Special ecological excursions are possible within the protected

area, although mass excursions and recreation are not advisable. The protected area covers 10–25% of the area of the regional landscape park.

The zone of regulated recreation (excursion zone) is the largest (50–70% of the parks' area), covering routes for regular excursions and ecological tourism. The main requirement for the regime is to preserve the existing landscape and prohibit the construction of large industrial facilities.

The stationary recreation zone is small in area (5–10% of the park's territory) and is intended to accommodate visitor service facilities such as hotels, motels, campsites, etc.

The economic zone includes the territories of settlements that are part of the park's boundaries. Traditional farming is conducted here in compliance with environmental protection requirements, and natural education and environmental awareness work is carried out among the population.

Any activity that leads or may lead to deterioration of the environment and reduction of the recreational value of the park's territory is prohibited in the territories of the regulated recreation, stationary recreation and economic zones.

7.4 Features of the development of regional landscape parks in the world and Ukraine

Institutions corresponding to regional landscape parks in the world are mostly called nature parks (Russia, Germany, Austria, etc.) or regional parks (Great Britain, Latvia), regional nature parks (France, Italy), and sometimes landscape parks (Poland). In Spain, for example, natural and landscape parks exist as separate categories. At the same time, Spanish landscape parks do not belong to the V (landscape protection area), but to the IV (area for the conservation of species and their habitats) category according to the IUCN. A feature of such parks in some countries is the creation of an additional protective strip around the park. However, landscape parks themselves can surround national parks and biosphere reserves, forming their buffer zone.

It should be noted that category V (landscape protection areas), according to the IUCN classification, to which Ukraine's regional landscape parks belong, is a much broader concept than a park created at the local level. This includes numerous sites in different countries that meet these criteria, such as an Area of Outstanding Natural Beauty or Special Area in the UK, an Ecological Reserve in Canada, and many others.

Also, some national parks and other protected areas in different countries are classified by IUCN as Category V. Although national parks occupy the largest areas in the world, the largest part of protected areas in Europe (56%) is occupied by Category V sites. The leaders here are mostly large European countries: Germany, France, Great Britain, and Spain.

International institutions pay considerable attention to the development of the network of Category V sites, and IUCN has developed a special program to promote their development. In particular, it emphasizes: "previously, protected areas were created against people, now they should be for their sake, for their well-being, and created with their participation." The action plan adopted at the meeting of the World Commission on Protected Areas noted that parks "can be a factor in improving the situation in conflict zones, binding the actions of both sides to conservation responsibilities in important areas, providing an opportunity for cooperation under international control".

The development of category five sites in Ukraine, including the regional landscape parks, confirms that Ukraine has taken into account European trends in nature conservation. The parks corresponding to the regional landscape parks began to develop rapidly in Europe since the late 1960s.

Parks in the European Union have a well-developed service infrastructure: campsites, parking lots, roads, equipped trails, etc. Many parks have websites. A good example is the information centers on the territory of regional parks. Here you can get booklets with information about the nature of the park, routes and interesting places, and prices. On special areas of the information center, visitors can examine animals living in the park, see typical plants planted in the park with their names,

buy local crafts, etc. For the most part, visits to the parks are free. Profit is generated by the use of services. The parks are also aimed at growing organic food, preserving traditional life, and folk crafts.

Italy is the leader in the number of regional parks, with 122 regional nature parks.

Germany stands out in terms of the territory occupied by local parks in the country. German nature parks (Naturparke) are much larger than other categories (in particular, national parks are 9 times larger), and they account for 63% of the nature reserve fund. In addition, parks have a very high percentage of the country's territory: they cover almost 19% of Germany. These are large territories that, according to the law, in addition to supporting environmentally sound recreation that does not harm the landscape, fulfill the tasks of protecting nature and the cultural landscape, and environmental education.

Regional parks also exist on other continents. Canada, for example, has a wide variety of parks, with more than 2,000 parks that correspond to different IUCN categories. The first parks were created in the late nineteenth century on the site of recreational areas. In general, the country's environmental protection system consists of the sum of these systems in the provinces (states), and each province has its own strategy for the development of protected areas and its own rather different legislation on protected areas. There are up to 75 categories of protected areas and objects, and the names, number, and even the understanding of a category with the same name vary significantly from province to province. The closest thing to European nature parks are Canadian territorial parks.

The formation of the network of RLPs in Ukraine is proceeding rapidly: as of January 1, 2011, there were 58 of them with a total area of 648.1 thousand hectares, and the share of RLPs in the nature reserve fund is 17.3%.

In 1990 (even before the official approval of this category of protected areas), the first RLP "Dniester Canyon" was created in Ternopil region on an area of 169.2 thousand hectares. Currently, there are 36 RLPs in the country, and their number and area are growing every year. The number and area of regional landscape parks within

the administrative units of Ukraine is shown in Table 11.1 (according to official data of the Ministry of Ecology and Natural Resources of Ukraine).

The RLPs represent the main natural regions of Ukraine. The parks contain species listed in the Red Data Book of Ukraine and communities from the Green Data Book, and on the other hand, historical monuments and other unique objects. The biotopic diversity of the parks determines the richness and diversity of fauna and flora.

Ukraine's network of RLPs will be developed both in the direction of increasing their number and intensifying their functioning. Unfortunately, most of the parks have not yet started their work due to objective economic factors and lack of funding. Ukraine has not exhausted the potential for creating RLPs and there is a great need for these facilities, as the country is quite densely populated, with a high degree of plowing and low forest cover.

The regions with high recreational potential are the Carpathians, Polissia, and the coastal strip of the Azov and Black Seas. It is necessary to create new RLPs in the central regions of Ukraine, as well as in the eastern regions, which are highly urbanized. In RLPs, it is possible to develop ecotourism, organize sport hunting and fishing, implement various environmental education activities, grow environmentally friendly products, develop folk crafts, etc. Parks should be created with the consent and for the benefit of the local population, provide new jobs and contribute to the economic development of the region.

Table 7.4 **Number and area of regional landscape parks within administrative units of Ukraine**

Administrative units	number	Area (ha)
Vinnytsia	3	11119,9
Volyn	—	—
Dnipropetrovska	2	9355,4
Donetsk	6	28099,8
Zhytomyr	—	—
Transcarpathian	1	10330,7
Zaporizhzhya	—	—
Ivano-Frankivsk	3	38455,0

Kyiv	2	5156,2
Kirovograd	1	17530,7
Autonomous Republic of Crimea	6	24235,0
Luhansk	1	14011,0
Lviv	4	47379,1
Mykolaiv	4	30494,5
Odesa	2	15320,0
Poltava	3	40225,0
Rivne	3	58708,0
Sumy	1	98857,9
Ternopil	3	42997,0
Kharkiv	5	19130,7
Kherson	—	—
Khmelnytsky	1	16915,3
Cherkasy* region	1	2297,3
Chernivtsi	2	36473,3
Chernihiv	1	78753,9
м. Kyiv	4	2242,1
м. Sevastopol	—	—
Total:	58	648087,8

Notes:

* – Trakhtemyriv RLP – 5148.7 hectares in Kyiv and 2297.3 hectares in Cherkasy regions

The actual area of the RLP is 647950.1 hectares (since the 137.7 hectares of Lysa Hora RLP is part of the Holosiivskyi RLP).

The fact that parks occupy significant areas in developed countries, have been successfully operating for decades, and their number is increasing annually, testifies to the effectiveness and vitality of this category. In general, regional landscape parks fit well into the economic system, as they take into account the interests of the region, in particular the land user and the local population. Therefore, the integration of regional landscape parks into the modern economy, into the renewed socio-economic system of Ukraine will meet the concept of sustainable development, ensuring the vital needs of the present generation without threatening future generations.

Nature reserves are one of the most widespread categories of nature reserve fund in Ukraine. Nature reserves are declared as natural areas (water areas) for the

purpose of preserving and restoring natural complexes or their individual components. The purpose of the reserves is to preserve and restore natural complexes, species or natural resources, and to maintain the overall ecological balance. Customers can be of national or local importance.

Nationally important reserves are those areas with natural complexes and objects whose conservation is of national importance, namely species listed in the Red Data Book of Ukraine, as well as global and European "red" lists; areas with plant communities listed in the Green Data Book of Ukraine, wetlands of international importance; areas of exceptional economic value (water protection, soil protection, forestry, etc.); areas that ensure protection of the gene pool of valuable medicinal plants and reserves of their raw materials, unique caves, balneological resources, etc.

Reserves of local importance are declared in areas where natural complexes and natural resources are mainly of regional or local importance: species of plants and animals subject to special protection in the territories of regions and the Autonomous Republic of Crimea, plant communities typical and rare for the regions, etc.

Depending on the origin, other features of natural complexes and objects declared as reserves, the purpose and the required protection regime, reserves are divided into types with a specific purpose:

- *landscape* – preservation or restoration of particularly valuable natural complexes (natural landscapes);
- *forest* – preservation or restoration of particularly valuable typical and unique forest plantations for Ukraine and its individual regions, which have environmental, scientific or applied value;
- *botanical* – conservation and restoration of scientifically, economically and culturally valuable, as well as rare and endangered plant species and their communities;

- *general zoological* – conservation and restoration of valuable in scientific, economic and cultural terms, as well as rare and endangered species of animals (subspecies, populations);
- *ornithological* – conservation and restoration of bird species (subspecies, populations) that are valuable in scientific, economic and cultural terms, as well as rare and endangered species, creating favorable conditions for birds during nesting, molting and wintering, and migration;
- *entomological* – conservation and restoration of scientifically, economically and culturally valuable, as well as rare and endangered insect species;
- *ichthyological* – conservation and restoration of scientifically and economically valuable, rare and endangered species, fish (subspecies, populations) in their spawning, feeding and wintering areas;
- *hydrological* – preservation and restoration of valuable water bodies and natural complexes (marsh, lake, river, sea);
- *general geological* – preservation of valuable objects and complexes of inanimate nature (geological outcrops, crystalline rock outcrops, mineral and other mineral deposits, remarkable landforms and related landscape elements);
- *paleontological* – preservation of places of finds and accumulations of remains or fossilized specimens of fossil flora and fauna of special scientific importance;
- *karst and speleological* – preservation of scientifically and recreationally valuable caves, surface karst and speleological formations of cave flora and fauna.

The assignment of a reserve to one of the above types indicates the main object of protection for which the territory was declared a reserve. This can be the landscape as a whole, or entomofauna, ichthyofauna, a single species, etc. Obviously, to preserve a part of the natural complex, it is necessary to preserve the entire complex.

The declaration of nature reserves is carried out without withdrawal of land plots, water and other natural objects from their owners or users, who are responsible for ensuring the protection and preservation of the territory.

Hunting and activities contrary to the goals and objectives set forth in the reserve's regulations are restricted or prohibited.

Economic, scientific and other activities that do not contradict the goals and objectives of the reserve shall be carried out in compliance with the general requirements for environmental protection.

Owners or users of land plots, water and other natural objects declared as a nature reserve undertake to ensure the regime of their protection and preservation. In this regard, there are certain problems with the protection of nature reserves.

Often the territory of one reserve is under the jurisdiction of several land users. The lands of some reserves (or parts of them) have no permanent users at all, and then the reserve is under the jurisdiction of local councils (city, town, village). Often, fulfillment of the tasks assigned to the reserve requires not only passive protection of the territory, but also the implementation of specific practical environmental activities. Since these activities require appropriate specialists, the coordination and conduct of scientific research in reserves is entrusted to employees of nature reserves located near the reserve.

It should be emphasized that nature reserves play an important role in the current network of protected areas in Ukraine. Due to their great diversity, number and location in regions with different natural, social and economic conditions, they are actually a support system for nature reserves and national parks, which increases the effect of the latter.

The Nature Reserve Fund of Ukraine (as of January 1, 2011) includes 2,922 reserves, of which 306 are of national and 2,616 are of local importance.

The term "natural monument" was first coined by O. Humbolt in the eighteenth century. During his trip (1799–1804) to South America, he saw giant trees of the mimosa family in Venezuela. In his travel report, he expressed the idea

of the need to preserve such objects as "relics of nature" or "natural monuments" and introduced this concept into the environmental Reference.

A *natural monument* as a category of protected objects is used in many countries.

Certain unique natural formations that have special environmental, scientific, aesthetic, cognitive and cultural significance are declared as natural monuments in order to preserve them in their natural state.

Depending on the origin and other features of natural complexes and objects declared as natural monuments, the purpose and required protection regime, natural monuments are of the following types:

- *botanical* – the object of conservation are unique populations of rare, relict, endangered, endemic plant species and their communities listed in the Red and Green Books of Ukraine, relevant international documents, samples of forest and artificial stands valuable for science and practice, individual trees, biogroups, groves of special importance, genetic and breeding areas, elements of park facilities;
- *geological* – the objects of conservation are certain forms of relief, tops of prominent mountains and hills, karst and ancient forms of relief with outcrops of granites, sandstones, shales, limestones, geological and geographical polygons, remains, caves, grottoes, deposit standards, rocks, glacial boulders, old quarries, locations of paleontological objects;
- *hydrological* – the objects of conservation are the sources of rivers, floodplains, marshes, lakes, ponds, waterfalls, thermal and mineral springs, mud deposits;
- *zoological* – the object of conservation is the places of stations, hibernations, colonies, populations of rare, endangered, relict, endemic species listed in the Red Book of Ukraine and relevant international documents;
- *complex* – the object of conservation is picturesque areas, nature's standards, unique natural landscapes with valuable biodiversity, mountain elements, cliffs, gorges, canyons, caves, valleys, moraine and boulder ridges.

Natural monuments that are unique or typical for the state are declared natural monuments of national importance. A natural object that is unique or typical for a certain region is declared a natural monument of local significance.

Declaration of natural monuments is carried out without withdrawal of land plots, water and other natural objects from their owners or users.

Any activity that threatens the preservation of natural monuments or leads to degradation or change of their original state is prohibited on the territory of natural monuments.

Owners or users of land plots, water and other natural objects declared as natural monuments undertake to ensure their protection and preservation.

Ukrainian legislation does not set any limits on the area that can be covered by territories and objects of this category. However, in practice, natural monuments in Ukraine are mostly small and truly unique territories or unique objects, for which often no area is defined at all (for example, for individual trees or springs). About 70% of natural monuments of national significance have an area of 10 to 100 hectares, most often several tens of hectares. About 10% of natural monuments have an area of less than 1 hectare.

As of January 1, 2011, there are 3,245 natural monuments in Ukraine, of which 132 are of national importance and 3,113 are of local importance.

Protected tracts, along with natural monuments and national parks, are one of the oldest forms of natural object protection that is most widely used in European countries.

Forest, steppe, marsh and other isolated holistic landscapes of important scientific, environmental and aesthetic significance are declared as protected tracts in order to preserve them in their natural state.

The features of protected tracts are defined in the name of this category. A tract is a remarkable (outstanding) area with clearly defined natural boundaries (e.g., a steppe gully, a water body, etc.); figuratively speaking, these are "micro-reserves." A strict nature reserve regime should be established on their territory - any activity that disrupts the natural processes taking place in natural complexes is prohibited.

The functional purpose of protected tracts is to preserve holistic landscapes in their natural state. Similar functions are performed by nature reserves, protected areas of biosphere reserves and national nature parks. However, unlike these categories of protected areas, which are protected areas of national importance, protected tracts are territories of local importance.

The declaration of protected tracts is carried out without the seizure of land, water and other natural objects from their owners or users. In other words, no environmental protection institutions are established on the basis of these territories, and no special administrations are created to manage them.

On the territory of protected tracts, any activity that disrupts the natural processes occurring in the natural complexes included in their composition is prohibited in accordance with the requirements established for nature reserves.

Owners or users of land plots, water and other natural objects declared as protected tracts shall undertake to ensure their protection and preservation.

Specialists of nature reserves located in the region should coordinate and conduct scientific research within protected tracts, develop methodological recommendations and some other activities.

The Ukrainian NRF includes 803 protected tracts (as of January 1, 2011).

The creation of different categories of protected areas and objects is one of the most important means of preserving biodiversity in the face of environmental degradation and increased economic development of Ukraine's natural resources.

Control questions and tasks

1. Explain the prerequisites for the formation of the concept of national parks.
2. Specify the main features of national parks according to the definition of IUCN.
3. Describe the main types of national parks.
4. List and explain the main tasks and functions of national parks.

5. Explain the main approaches used to address the issue of choosing a territory for the creation of a national park.

6. What criteria should be considered when choosing a national park?

7. Explain the purpose of the Udvardi biogeographic zoning scheme.

8. For what purposes is the functional zoning of the territory of national parks?

9. Specify the difference between the functional zoning of the territory of national natural parks of Ukraine and national parks on the recommendations of the IUCN.

10. Explain the reasons why a relatively small number of European countries have national parks of category II.

11. Define the concept of "regional landscape park" and outline the main functions and tasks of this category in the structure of the nature reserve fund of Ukraine.

12. Specify the criteria used for the inclusion of a particular territory in the regional landscape park.

13. Describe the differences between such categories of NRF as a national nature park and a regional landscape park.

14. Specify the main functional areas characteristic of the territory of the regional landscape park.

15. Describe the features of the development of regional landscape parks in the world in comparison with national practice.

16. Outline the prospects for the development of a national network of regional landscape parks.

17. Specify the main types of reserves and their purpose.

18. What is the importance of the reserves in the modern network of nature reserve fund of Ukraine?

19. Define the concept of "natural monument" and indicate their main types.

20. Describe the features of the "protected tract" as a category of nature reserve fund of Ukraine.

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SECTION 8. ARTIFICIALLY CREATED TERRITORIES AND OBJECTS OF THE NATURE RESERVE FUND OF UKRAINE

Outline

8.1 Botanical gardens

8.2 Dendrological parks

8.3 Zoological parks

Botanical gardens, dendrological parks, zoological parks and parks-monuments of landscape art are among the most widespread categories of the nature reserve fund of Ukraine, reflecting the entire palette of both typical and unique natural objects.

8.1 Botanical gardens

The first botanical gardens on the territory of Ukraine began to be organized in the early nineteenth century. In 1804, a botanical garden was founded at Kharkiv University, in 1806 – at the Higher Volyn Gymnasium in Kremenets, and in 1812 – the Nikitsky Botanical Garden in the Crimea. This category was added to the nature reserve fund in 1983.

Botanical gardens are created for the purpose of preservation, study, acclimatization, reproduction in specially created conditions and effective economic use of rare and typical species of local and world flora by creating, replenishing and preserving botanical collections, conducting scientific, training and educational work.

Botanical gardens may be of national or local importance

Botanical gardens of national importance are scientific and research environmental protection institutions, while botanical gardens of local importance may be granted the status of a scientific and research institution in accordance with the established procedure.

The plots of land and water space with all natural resources shall be withdrawn from economic use and provided to botanical gardens in accordance with the procedure established by the legislation of Ukraine.

Botanical gardens can be either separate legal entities or part of a research institution or educational institution. To manage them, special administrations are created, which include scientific and technical staff, administrative and economic staff and security service, or they are serviced by the staff of the body under whose jurisdiction they are located.

Structure of the territory and basic requirements for the regime of botanical gardens

It is prohibited to carry out any activity on the territory of botanical gardens that is not related to the fulfillment of their tasks and threatens the preservation of flora collections.

Within botanical gardens, in order to ensure the necessary regime of protection and efficient use, the following zones may be allocated:

- ✓ *exposition* – its visit is allowed in accordance with the procedure established by the administration of the botanical garden;
- ✓ *scientific* – the zone includes collections, experimental plots, etc.; only employees of the botanical garden in connection with their official duties, as well as specialists of other institutions with the permission of the garden administration have the right to visit it;
- ✓ *protected* – visiting it is prohibited, except when it is related to scientific observations; administrative and economic.

Zoning of the territory of botanical gardens is carried out in accordance with the Regulations on the botanical garden and the Project of organization of the territory of the botanical garden, which is developed by specialized scientific and design institutions and approved by the body under whose jurisdiction the botanical garden is located, in agreement with: the central executive body in the field of environmental protection – for botanical gardens of national importance.

Educational and upbringing function of botanical gardens The existing experience of various activities of botanical gardens shows that today it can affect almost all spheres of society. Every day the functions of botanical gardens are expanding. The urgent requirements of the time are active exchange of experience,

study of botanical gardens' traditions, and broad discussion of the prospects for the development of various areas of interaction between gardens and society.

The International Botanical Garden Council for Plant Protection (BGCI) proposed the following definition of a botanical garden: "botanical gardens are organizations that have documented collections of living plants and use them for scientific research, biodiversity conservation, demonstration and educational purposes."

Today, there are more than 2,200 botanical gardens in 153 countries, with collections ranging from hundreds to tens of thousands of taxa.

Today, educational tasks are the most important functions of all botanical gardens in the world, regardless of their state or public status. Moreover, educational activities provide a lot of budgetary funds in such major botanical gardens of the world as the Royal Gardens in Kew (England), the New York Botanical Garden in the Bronx, the Chicago Botanical Garden, the Missouri Botanical Garden (all in the United States), the Royal Botanical Garden in Brussels (Belgium), and others.

Naturally, this activity is the main one for botanical gardens that are part of universities and other professional educational institutions all over the world. Of course, botanical gardens around the world also carry out extensive scientific work.

They preserve and study many rare and endangered plant species brought from all over the world. Botanical gardens are of great importance in the general biological, ecological and public education. They are visited by many hundreds of millions of people every year, and in many gardens around the world, visitors' access to park ensembles and open-air expositions is free or discounted for various categories of visitors (especially schoolchildren and students). Even with such unorganized visits to botanical gardens, visitors have the opportunity to replenish their knowledge, even with regard to the most common plants of the local flora or widely cultivated in the region, since in botanical gardens plants are well labeled, they are scientifically named correctly, and for exotic plants their homeland is often indicated.

Botanical gardens also conduct special excursions to greenhouse complexes,

to specialized collections of useful plants: medicinal, spicy-aromatic, cultivated cereals, legumes, vegetables, and floral and decorative plants.

Many botanical gardens around the world have expositions illustrating this or that system of flowering plants, the idea of families of flowering plants in one or another systematized form. There are also often geographically organized expositions where plants from different regions of the Earth are collected in separate areas (both in the open field and in greenhouse complexes).

Botanical gardens are often monuments of human culture. These include the general park ensemble, buildings of certain eras, and magnificent small architectural forms such as gazebos, pavilions, bridges, arches, trellises with climbing plants. These are also greenhouse complexes, often with magnificent individual structures – large greenhouses, artificial ponds, both open and under glass. Botanical gardens decorated with sculptural compositions, as well as exemplary structures of garden art itself, such as Japanese and Chinese gardens, European park ensembles of various styles, magnificent lawns, flower beds, and rabatki, are quite common.

Botanical gardens often serve as memorials, being in some part monuments to their founders, often very prominent public and scientific figures.

Botanical gardens are of great importance for special education. In higher education institutions, they are, first of all, a base for providing visualization of botanical and environmental courses.

The most frequent forms of educational activity in the scientific work of botanical gardens are the forms of training of students who perform term papers and diploma or bachelor's and master's theses in botanical gardens within the framework of scientific topics or projects under the guidance of botanical garden researchers.

As of January 1, 2011, there are 28 botanical gardens in Ukraine, 18 of which are of national importance and 10 of local importance.

8.2 Dendrological parks

Dendrological parks are created for the purpose of preserving and studying various types of trees and shrubs and their compositions in specially created conditions for the most effective scientific, cultural, recreational and other use.

Dendrological parks of national importance are scientific and research environmental protection institutions. Dendrological parks of local significance may be granted the status of a scientific research institution in accordance with the established procedure.

Land plots with all natural resources shall be withdrawn from economic use and provided to dendrological parks in accordance with the procedure established by the legislation of Ukraine.

The main tasks, areas of research work in dendrological parks, as well as the organizational and legal framework for their functioning are the same as for botanical gardens. The main difference is that the purpose of creating dendrological parks is to study and preserve species of trees and shrubs.

Basic requirements for the regime of dendrological parks

On the territory of dendrological parks, it is prohibited to carry out activities that are not related to the fulfillment of their tasks and threaten the preservation of dendrological collections.

The territory of dendrological parks may be zoned in accordance with the requirements established for botanical gardens.

The project of organization of the territory of the dendrological park shall be developed by specialized scientific and design institutions and approved by the body under which the dendrological park is subordinated, in agreement with: the central executive body in the field of environmental protection – for dendrological parks of national importance; by the bodies of the central executive body in the field of environmental protection at the local level, and in the territory of the Autonomous Republic of Crimea – by the executive body of the Autonomous Republic of Crimea on environmental protection – in relation to dendrological parks of local importance.

To manage arboretums of national importance, special administrations are created, with appropriate specialists, security and economic services. In fact, only the Trostianets, Sofiyivka, Oleksandriia, Veseli Bokovenky, Syretskyi and other arboretums in Ukraine are managed by various enterprises, institutions and organizations. Most of the dendrological parks were founded in 1950–1970, while

others were created on the basis of old parks established in the XVIII–XIX centuries. Modern parks differ from old parks classified as parks-monuments of landscape art mainly in that they are research institutions or serve as a base for conducting research on forestry, dendrology and park construction for forestry enterprises, higher education institutions, etc. As of January 1, 2011, there are 54 dendrological parks in Ukraine, 19 of which are of national importance and 35 of local importance.

8.3. Zoological parks

Zoological parks are established to organise environmental education and education, to create expositions of rare, exotic and local animal species, to preserve their gene pool, to study wild fauna and to develop scientific bases for their captive breeding.

This category was introduced into the Nature Reserve Fund of Ukraine in 1983.

Zoological parks of national importance are nature conservation, cultural, educational and research institutions.

In accordance with the procedure established by the Law of Ukraine "On the Nature Reserve Fund of Ukraine" and other acts of Ukrainian legislation, lands with all natural resources are withdrawn from economic use and allocated to zoological parks.

The main tasks of the Zoological Park are: formation and maintenance of animal collections; preservation and reproduction of animals (primarily rare and endangered species) of domestic and foreign fauna of scientific, economic, cultural and educational importance in artificial conditions; demonstration of rare, exotic and local species to the public; conducting research; keeping primary records of cadastral data; keeping state records of animal collections; study, generalization and implementation of domestic and foreign experience in keeping animals in captivity; conducting scientific and educational work in the field of ecology, zoology and nature protection, hunting; dissemination of environmental and educational knowledge that contributes to the formation of the environmental outlook of the

population in the field of ecology; creation of subsidiary farms, nurseries, laboratories, workshops, youth activity centers, permanent and temporary (stationary and mobile) animal exhibitions, pet shops and other facilities; implementation of various forms of cultural services, creation of conditions for full recreation and leisure of the population, if it does not threaten the preservation of favorable conditions for the life of animals.

Structure of the territory and basic requirements for the regime of zoological parks

On the territory of zoological parks, it is prohibited to carry out activities that are not related to the fulfillment of their tasks and threaten the preservation of favorable conditions for the life of animals in these parks.

In order to ensure the fulfillment of the tasks assigned to them, the following zones are allocated on the territory of zoological parks:

exposition – intended for stationary keeping of animals and their use for cultural and educational purposes;

scientific – within its boundaries scientific and research work is carried out; visiting the zone is allowed in accordance with the procedure established by the park administration;

recreational – is intended for organization of recreation and servicing of the park visitors;

economic zone – a zone where auxiliary economic facilities are located.The project of organization of the territory of a zoological park shall be developed by specialized scientific and design organizations and approved by the body under which the zoological park is subordinated, in agreement with: the central executive body in the field of environmental protection – for zoological parks of national importance; bodies of the central executive body in the field of environmental protection on the ground, and on the territory of the Autonomous Republic of Crimea – the executive body of the Autonomous Republic of Crimea. Zoological parks may organize mobile exhibitions of animals and have subsidiary farms established to

provide animals with food. As of January 1, 2011, there are 12 zoological parks in Ukraine, 7 of which are of national importance and 5 of local importance. 8. 4 Parks–monuments of landscape gardening art the most outstanding and valuable examples of park construction are declared as parks-monuments of landscape gardening art for the purpose of their protection and use for aesthetic, educational, scientific, environmental and health purposes. They are of national and local importance. Parks–monuments of landscape gardening art of national importance are nature conservation and recreational institutions. The declaration of parks-monuments of landscape gardening art is carried out with or without withdrawal of land plots, water and other natural objects from their owners or users in accordance with the established procedure.

The main purpose of parks-monuments of landscape art is to preserve, maintain and restore park landscape compositions, as well as to conduct excursions and public recreation. Scientific research can also be conducted on the territory of parks-monuments of landscape art. They combine environmental protection functions with historical, cultural and aesthetic functions.

Basic requirements for the regime of parks-monuments of landscape gardening art

On the territory of parks-monuments of landscape gardening art, it is prohibited to carry out any activity that is not related to the fulfillment of their tasks and threatens their preservation.

On the territory of parks-monuments of landscape art, excursions and mass recreation are provided, plantations are cared for, including sanitary felling, reconstruction and maintenance felling with replanting of trees and shrubs of identical species composition to replace those that have died; measures are taken to prevent self-seeding, preserve compositions of trees, shrubs and flowers, grass lawns.

The territory of parks-monuments of landscape art may be zoned in accordance with the requirements established for botanical gardens.

The maintenance and reconstruction of parks-monuments of landscape art is

carried out according to projects developed by specialized scientific and design institutions and approved by the bodies under whose jurisdiction these parks are located, in agreement with: the central executive body in the field of environmental protection – in respect of parks-monuments of landscape art of national importance; by the bodies of the central executive authority in the field of environmental protection at the local level, and in the territory of the Autonomous Republic of Crimea – by the executive authority of the Autonomous Republic of Crimea on environmental protection – in respect of parks-monuments of landscape gardening art of local importance.

Owners or users of land plots, water and other natural objects declared as parks-monuments of landscape gardening art shall undertake obligations to ensure the regime of their protection and preservation.

A significant part of the parks-monuments of landscape art in Ukraine are old parks created in the XVII – XIX centuries. The parks were laid out around large estates owned by individual wealthy families. They were created using the natural features of the landscapes, which were enriched with artificial plantings, ponds, architectural structures, and occupied large areas. Nowadays, ancient parks-monuments of landscape art are used as places of mass recreation or as territories of health and medical institutions.

Today, a special administration has been created to manage only three outstanding parks located in the AR of Crimea – Massandra, Miskhorsky and Livadia. Other parks are managed by enterprises, institutions and organizations under whose jurisdiction and on whose lands these parks are located.

As of January 1, 2011, there are 547 parks-monuments of landscape art in Ukraine, of which 88 are of national importance and 459 are of local importance.

Control questions and tasks

1. Describe the purpose of creating and specify the main tasks of botanical night gardens.
2. Describe the structure of the territory and the basic requirements for the regime of botanical gardens.

3. What is the educational function of botanical gardens?

4. Define the concept of "dendrological park" and describe the status of this category of nature reserve fund.

5. Specify the basic requirements for the regime of dendrological parks.

6. Formulate the tasks of zoological parks in the system of nature reserve fund.

7. Explain the structure of the territory and the basic requirements for the regime of zoological parks.

8. Formulate the main purpose and reveal the purpose of parks-monuments of landscape art.

9. Specify the types of activities allowed on the territory of parks-monuments of landscape art.

10. Which of the artificially created categories of nature reserve fund is the most common in Ukraine.

Tasks for self-study

Using specific case studies, prepare a report on the role of artificially created territories and objects of the nature reserve fund in scientific, cultural, recreational, educational and upbringing activities.

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PRACTICAL WORK IN THE DISCIPLINE «NATURE RESERVE»

Practical work №1

Topic: Determination of the characteristics of forest plantations in the territory of the projected nature reserve fund.

Aim: to learn how to conduct forestry measurements and determine the parameters of forest plantations of the territory proposed for conservation.

Task: to characterize the forest plantations of the territory of the projected object of the Nature Reserve Fund.

Instruments and materials: measuring fork, altimeter, full-tome meter, Presler's drill, geodetic pole, measuring tape, taxation descriptions, forest inventory guides, electronic maps.

To perform the work, students are organized into groups of 3–4 people. In the course of the work, the following indicators of forest plantations are established: area, composition of the plantation, age, average height and diameter, relative completeness, class of bonitas, forest type, stock, characteristics of undergrowth and understory, description of living ground cover and forest floor. Survey the research area. Establish sample plots according to the generally accepted methodology [20], using the enumeration method of taxation. Based on the results of a continuous list of trees, using the methods described in [15, 20], determine: average height and diameter, relative completeness, class of bonita, forest type, and stock. Present the results in Table 1.

Brief theoretical information

Forests can be an important component of the biota of a territory that may be proposed for conservation. Thus, when writing a scientific justification, and subsequently, ground monitoring, information on the characteristics of forest plantations and their dynamics is mandatory. Such surveys are provided for by the Law "On the Nature Reserve Fund of Ukraine". They are also conducted during the

preparation of EIA (environmental impact assessment) reports.

Table 1

Characteristics of forest plantations

User/landowner	Area, hectares	Plantation composition	Age, years	Height, meters	Diameter, cm	Fullness	Class of bonitas	Forest type	Stock, m3	Underfgrowth characteristics	Characteristics of the understory

In the region of the Ukrainian Carpathians and the Transcarpathian Plain, most of the objects of the Nature Reserve Fund were created on the basis of forest areas. In a significant number of national parks, there are "Forest" departments, one of the tasks of which is to monitor forest plantations. Thus, the ability to conduct a forestry survey has a significant practical aspect. This practical work involves collecting information on the site of the projected NRF object, area, composition of the plantation, age, height, diameter, fullness, class of bonita, characteristics of the undergrowth and understory.

Work progress

Before starting work, students familiarize themselves with the procedure for working with instruments used to measure the main taxation indicators of forest stands.

In addition to characterizing the plantations, prepare a map of the territory of the projected protected area. For this purpose, you can use information from instrumental (bussel) surveys or Google Earth resources. Draw the following conclusions

Control questions:

1. What regulatory documents provide for the characterization and monitoring of forest plantations?

2. What is the purpose of characterizing forest plantations in the projected area?

3. What information is included in the characterization of forest stands?

4. How is information about forest plantations used?

5. For which objects of the Nature Reserve Fund is the characterization of forest stands mandatory?

Practical work №2

Topic: Phenological observations on the territory of the projected facility

Aim: to acquire practical skills in organizing and conducting

Work progress

Phenological observations are carried out in two stages: 1) organizing observations and 2) conducting observations.

When organizing observations, select the object and place of phenological observations on the territory of the NRF. Learn the principles of keeping a diary of phenological observations and making a nature calendar.

Task: carry out phenological observations on the territory of the projected object of the Nature Reserve Fund.

Instruments and materials: binoculars, identifiers, reference books, journal of phenological observations.

Brief theoretical information

Phenology is the science of seasonal phenomena in nature, which studies periodic phenomena in living and non-living nature associated with changes in the seasons, as well as seasonal phases of plant functioning and seasonal features of animal activity rhythms. The term was introduced into scientific circulation in 1840 by the Belgian botanist S. Morrand. Phenological observations allow collecting extensive factual material for mathematical processing and, accordingly, establishing the regularity, periodicity, and cyclicality of natural phenomena, building mathematical models, and making forecasts. Today, meteorology has more than 100 years of data on inanimate nature phenomena and makes it possible to make forecasts based on mathematical models. Phenology cannot currently boast of such long-term research, but some research centers have 50–70 years of phenological data, and most have 25–30 years. For wildlife, this is a short period of time, so phenological observations of wildlife are relevant. The easiest way to record phenological observations is to keep a "nature calendar".

«The Phenology» section is a mandatory element of the «Chronicle of

Nature», which is kept annually in national nature parks, state reserves, and biosphere reserves.

Observations should be made in the most typical place for the study area, where you should set up a phenological point, identifying the main objects to be observed – representatives of the flora and fauna that will serve as phenoindicators. The size (area) of the phenological point can be quite variable (100, 200, 400... m^2) and is set within such limits as to fully cover all elements of the community (plant, animal). Describe the phenological point, indicating: 1) date of establishment; 2) geographical location (coordinates) / administrative location of the user (SE "Forestry", forestry, quarter, allotment); 3) altitude; 4) relief; 5) slope exposure; 6) soil conditions; 7) area; 8) species composition of plants and animals. Enter all of the above information in the phenological site passport form provided in Appendix A. Be sure to draw a map of the phenological site.

The next step is to make observations. During the observations, characterize the weather conditions at the time of the observations. According to the diagnostic characteristics given in the works of I.N. Bideman [4] and G.E. Schultz [36], set the timing of the phenological phases of the studied objects. Record them in the journal of phenological observations, the form of which is given in Tables 1–2 of Appendix B. Make observations every 2–3 days. Based on the results of the work, draw conclusions.

Control questions:

1. What is phenology, when did this term appear, and who coined it?
2. Why is the nature calendar kept?
3. Which manuscript contains a section on phenological observations?
4. What is the difference between meteorological observations and phenological?
5. What can be established through mathematical processing of phenological observations?

Practical work №3

Topic: Vertebrate fauna (impacts of activities) on the territory of the projected protected area.

Aim: to acquire practical skills in accounting for the vertebrate fauna according to the consequences of their vital activity.

Task: to determine the species composition of the vertebrate fauna on the territory of the projected object of the Nature Reserve Fund.

Equipment and materials: binoculars, camera, recorder, notebook, pencil, plastic bags and containers.

Brief theoretical information

There are many methods of vertebrate fauna accounting that are carried out to identify vertebrate species in a particular area, but none of them gives a hundred percent result. This is due to the fact that a significant number of vertebrate species are nocturnal and it is difficult to see them directly. Therefore, among the methods of accounting, there are also accounting based on the results of activities (for example, river beaver). Modern devices, such as photo traps, allow for more accurate recording of the species' presence, as there is a photo, but it is impossible to obtain quantitative data in this way. When conducting surveys, you should follow the planned method (route, point, on trial plots, etc.) and do not change the method. Before you start, you should familiarize yourself with the territory, draw up a map or use a ready-made map. It is advisable to synchronize the accounting of all fauna, for which purpose it is necessary to distribute the participants of the accounting. In this way, you can get information about the ornithofauna, terriofauna, batrachofauna, herpetofauna, and identify species of the Red Data Book and regional red lists. To identify as many species as possible, surveys should be conducted in all seasons.

Work progress

The work is performed by students in groups of 4. Before starting work,

familiarize yourself with the methods of vertebrate census [5, 22] and determine the research routes in advance. While walking the route, record in a notebook all cases of animal encounters or their consequences of activity and determine their species. If it is difficult to identify the species, take pictures/drawings or take them with you if you find any traces: footprints on the snow/soil, damage to fruits/cones, gnawed shoots and branches of undergrowth, burrows, bird nests, defecation, prey remains, etc. This will allow you to further process the collected material in the field. To identify the species, use the following keywords [3, 5, 10, 14, 18, 22] To facilitate the work, it is recommended that each student in the group investigate a separate class of vertebrates. Based on the results of your research, make a consolidated list of animal species that occur on the territory of the studied object of the Nature Reserve Fund. Draw appropriate conclusions.

Control questions:

1. What is the difference between route accounting and point accounting?
2. Why can't a photo trap be used for accounting?
3. How many times should the vertebrate fauna be counted?
4. Can one checker taker count all the fauna?
5. Is it possible to obtain one hundred percent information about the species composition of the vertebrate fauna by route accounting?

Practical work №4

Topic: Inventory of the insect fauna on the territory of the projected or existing object of the Nature Reserve Fund.

Aim: learn how to collect and record insects on the territory of the Nature Reserve Fund.

Task: conduct a primary inventory of insect fauna.

Equipment and materials: entomological nets, cotton swabs, tweezers, solutions for fixing insects, binoculars, identifiers**.**

Brief theoretical information

Insects are the largest class of invertebrates by number of species. There are many and varied methods for studying the insect fauna, strongly dependent on a particular systematic group. Pheromone traps, entomological nets, direct collection of insects, light traps, etc. can be used to inventory the insect fauna. When collecting, one should take into account the biological and ecological characteristics of insects, their life cycles, and daily activity. In the field, you should try to examine all possible habitats of insects. The captured insects can be fixed in different ways, the most common of which is in an alcohol solution, followed by the formation of a collection of cotton wool, entomological boxes. In detail, the work on species identification should be carried out by a specialist entomologist of the relevant systematic group, but every employee of the scientific department of the National Nature Park, Regional Landscape Park, and state reserves should be able to collect the material, accumulate it, and form a collection of cotton woolen boxes. The removal of insects from nature should be carried out in accordance with previously issued limits, according to the current legislation. More details on different methods of insect collection can be found in the specialized literature.

Work progress

Practical work is carried out by students in groups of 4. Before starting work, familiarize yourself with the methods of accounting, collecting, and preserving insects, the tools used, and the principles of working with identifiers [3, 22]. Familiarize yourself with the research area, determine the research route, which should run through the most typical and fairly homogeneous terrain. Collect entomological material in the most typical places of the route using the methods described in the work of L.A. Potish and S.I. Farinets [22] or other sources [3, 29]. Process the collected material in the office, make waders and make a list of insect species (at the level of rows) that occur on the territory of the study site of the Nature Reserve Fund.

Control questions:

1. Name and describe the most common methods of insect accounting.
2. What tools are used in the accounting of entomofauna?
3. Describe the methods of preservation of collected material.
4. Why is the inventory of insects in the territories of the Nature Reserve Fund?

Practical work № 5

Topic: Accounting and inventory of the flora of the territory of the projected object of the Nature Reserve Fund.

Aim: to acquire skills in collecting, identifying and making herbarium specimens of plants in the course of flora accounting on the territory of the projected object of the Nature Reserve Fund.

Task: Determine the species composition of the flora in the study area.

Equipment and materials: digger, herbarium folder, notebook, pen, simple pencil, labeling paper, herbarium paper (regular size newspapers), camera, identifiers, herbarium press for drying plants.

Brief theoretical information

The results of accounting and inventory of phytobiota lay the foundation for the development of a system of state accounting and cadastre of the nature reserve fund. Based on the results of the state accounting of the floral diversity of the nature reserve fund, it is advisable to carry out a scientific analysis of its ecological and environmental status every year, and every five years – a monitoring assessment of the dynamics of biodiversity and an overall assessment of the state of biodiversity conservation.

Work progress

The work is performed by students in groups of 2–3 people. Before you start, familiarize yourself with the methods of collecting, labeling and herbarization of plants, the tools used for this purpose, as well as the basic principles of working with plant identifiers [6, 8, 17, 36].

In the course of the work, it is necessary to investigate the species composition of the flora (vascular plants, mosses, lichens and fungi) in the study area. For this purpose, field surveys are carried out to collect research material and chamber work is carried out to process the collected material.

Field research is carried out using the detailed route method. Make a research

route and coordinate it with your teacher. As you go along the route, record all the plants, mosses, lichens, and fungi that you encounter along the way. Collect, herbarize, label, number, and record the plants in a notebook under the appropriate number, and then determine the species of the herbarized plant in the classroom..

During the desk work, students process (drying, labeling of herbarium plants), identify and systematize the collected material. To determine the plant species, use the keywords [6, 8]. Present the collected and processed material in the form of an ordered list or table, indicating the family, genus and species of plants found on the territory of the study site of the Nature Reserve Fund. The names of plant species are given in accordance with the Code of Botanical Nomenclature in Ukrainian and Latin.

Control questions:

1. Why is it necessary to record and inventory the flora of the projected object of the Nature Reserve Fund?
2. What are the stages of flora accounting and inventory?
3. What is the difference between field research and desk research?
4. What is the purpose of plant herbarization?
5. What is the purpose of labeling the collected herbarium material?
6. Describe the relationship between the concepts of "species", "genus", "family".
7. Name the main determinants used to identify plants.

Practical work № 6

Topic: Objects of the Nature Reserve Fund of local importance of the settlement.

Aim: to learn how to take an inventory of the objects of the nature reserve fund of local importance in a particular settlement of the Transcarpathian region.

Task: to investigate the state of the objects of the Nature Reserve Fund of local importance of the settlement (at the place of residence).

Tools and materials: cadastre of territories and objects of the Nature Reserve Fund (region, place of residence), Internet resources.

Brief theoretical information

In accordance with the current legislation, local governments may create objects of the Nature Reserve Fund on the territory of administrative units under their jurisdiction. These may include nature reserves, natural monuments, protected tracts, regional landscape parks, and parks of landscape art of local, district, and regional significance. Such objects form the nature reserve fund of settlements, districts, regions, and state forestry enterprises. Information about such objects is not widely available to the general public, and if the object does not become a subject of tourism, few people know about its existence. The inventory of such objects is relevant given that often the condition of a unique tree, exotic plantation, etc. may deteriorate or the aesthetic value may be lost (broken tree; tree affected by phytopathogens; dead tree; construction). This is mostly the case with exotic trees, shrubs, and mineral springs. Information about the objects of the Nature Reserve Fund of administrative units is of important social and economic importance.

Work progress

Using the information from the state cadastre of territories and objects of the Nature Reserve Fund of the region, select a local nature reserve object in the territory of the settlement (at the place of residence) for research. Provide an informational description of the object under study (information on its creation,

protected user, area, type, status, significance, etc.) Find the object in nature and assess its current condition. Present the results of your work in the form of an abstract and a report. The presentation of information can be in the form of an excursion to the object of the Nature Reserve Fund under study.

Control questions:

1. Define the concepts of "protected object" and "protected area".
2. Name the classification of objects of nature reserve fund by IUCN.
3. Name the current classification of objects of nature reserve fund of Ukraine.
4. Name the categories of objects of the Nature Reserve Fund of local importance.

Practical work № 7

Topic: Objects of the Nature Reserve Fund of national importance of the settlement.

Aim: get acquainted with the objects of the nature reserve fund of general state importance of a particular settlement of the region, at the place of residence.

Task: identify the objects of the Nature Reserve Fund of national importance in the settlement (at the place of residence). Prepare an abstract and reports for discussion on the topic of the class.

Instruments and materials: cadastre of territories and objects of the Nature Reserve Fund (oblast, place of residence), reference books, Internet resources.

Brief theoretical information

The status of "national" is the highest rank of protection, as this territory protects something unique not only for the region, but for the entire country. Accordingly, the decision to grant such a status is made at the level of the Cabinet of Ministers of Ukraine, the Verkhovna Rada of Ukraine, or by presidential decree. Sometimes the status of a national object may be unclear to the local population, which is often the case in the regions. For example, in the Carpathian region, there are disputes with the population over the protection of species in the Red Data Book of Ukraine. The spotted salamander, the alpine newt, and the red-bellied darter are "common" species for the Zakarpattia region, and the granting of the national status to the area where they occur is unclear. It should be noted that this status is granted to those sites of the Nature Reserve Fund where something unique in the whole country is protected. The above species do not occur anywhere else except in the Carpathian region and therefore become the basis for granting the "national" status. Accordingly, the steppe part will have its own "ordinary" species that we will not find anywhere else.

Work progress

Using the information from the state cadastre of territories and objects of the Nature Reserve Fund of the Transcarpathian region, identify and describe the

objects of the Nature Reserve Fund of national importance on the territory of a particular settlement or administrative district (at the place of residence), (provide information on the creation, the balance holder, the protected area, type, etc.) Present the results of your work in the form of an abstract and a presentation.

Control questions:

1. What is the cadastre of territories and objects of the Natural Reserve Fund of Ukraine?
2. Name the purpose, tasks and status of the "Nature Reserve".
3. Name the purpose of creation, tasks and status of the "Biosphere Reserve".
4. Name the purpose of creation, tasks and status of the "National Park".
5. Name the purpose of creation, objectives of the creation of reserves.
6. Name the purpose of creation, tasks of creation of natural monuments, protected areas.
7. Name the objects of the Nature Reserve Fund of the highest category in the Transcarpathian region.

Practical work № 8

Topic: Determination of the protection status of flora representatives of the existing object of the Nature Reserve Fund.

Aim: to acquire practical skills in determining the conservation status of flora.

Instruments and materials: Red Data Book of Ukraine, decisions of regional council sessions, IUCN species list, Bern Convention, Bonn Convention, CITES, Ramsar Convention.

Task: Establish the protection status of plant species in the existing nature reserve fund.

Brief theoretical information

The inventory of threatened (rare and endangered) plant species is a basic element in ensuring the protection of the rare phytogenetic gene pool. Important components of the protection of the rare phytogenetic gene pool are also its sozological assessment and the development of scientific principles for its protection.

The sozological status of threatened plant species is assessed based on the categories adopted by the IUCN Threatened Plants Unit, as well as the categories specified in the Red Data Book of Ukraine. When determining the sozological status, it is also advisable to use the autphytosozological index (API) – integral indicator that is the result of a comprehensive assessment of the status of the species under study.

For a complex assessment, some basic parameters of plant species related to their scientific and natural significance, taxonomic representativeness, distribution, threat level, reproductive capacity and other conservation attributes are studied and taken into account. More detailed information on the definition of API is provided in the work of S.M. Stoyko et al. (2004) [31].

Work progress

During the class, students receive an individual assignment in the form of a list

of plant species growing on the territory of a certain object of the Nature Reserve Fund. Using the official protection documents [9, 12, 13, 25, 26, 32, 37], determine the protection status of plant species growing on the territory of the studied NRF object. For convenience, all the necessary information is proposed to be organized in the form of Table 2, in the cells of which put a "+" opposite the protection documents according to which the species is protected.

Table 2

Protected status of plant species

Name (ukr./lat.)	**Protection status according to**						
	IUCN Red List	European red list	The Red Book of Ukraine	Berne Convention	Bonn Convention	CITES list	Regional red lists

Based on the results of the work performed, draw conclusions and indicate the main causes of the extinction of the studied plant species and measures for their protection.

Control questions:

1. Name the international documents on the protection of plant species.
2. What international instruments on the protection of flora ratified in Ukraine?
3. Give the species of plants of the studied object of the Nature Reserve Fund, which are listed in the Red Book of Ukraine.
4. What are the differences between the list of plant species in the Red Data Book of Ukraine and the list of plant species in a particular regional Red List?
5. What categories of conservation status of a species are listed in the Red Data Book of Ukraine?

Practical work № 9

Topic: Determination of the conservation status of fauna representatives of the existing object of the Nature Reserve Fund.

Aim: to acquire practical skills in determining the conservation status of fauna representatives.

Task: Establish the protection status of animal species in the existing nature reserve fund.

Instruments and materials: Red Book of Ukraine, decisions of regional council sessions, IUCN species list, Bern Convention, Bonn Convention, CITES.

Brief theoretical information

The lists of protected species are constantly reviewed, supplemented, and clarified. Ukraine ratifies international conventions and assumes obligations to protect species not listed in the Red Data Book of Ukraine, etc. Thus, the protected status of a species can change and the legislation provides for its constant revision. Unfortunately, there are few examples of species being removed from the "protection" lists. More often than not, more and more species are included in the lists. At the same time, the presence of species on the national (including the regional aspect) or international list of protected species indicates the value of a particular object of the Nature Reserve Fund. There are cases when a species disappears from the territory and there is a need to change the status of an existing NRF site.

The existing objects of the Nature Reserve Fund of Ukraine are, in the vast majority of cases, well studied by various specialists, botanists or zoologists. Therefore, based on the literature, it is possible to compile a list of plant or animal species and clarify their protection status.

Work progress

Before the class, students receive an individual assignment in the form of a list of animal species found on the territory of a particular NRF site. Using the official protection documents [9, 12, 33, 34, 37], determine the protection status of animal

species found on the territory of the existing NRF site. For convenience, all the necessary information is proposed to be organized in the form of Table 3, in the cells of which put a "+" opposite the protection documents according to which the species is protected.

Based on the results of the work performed, draw conclusions and indicate the main causes of the extinction of the studied species and measures for their protection.

Table 3

Conservation status of animal species

Name (ukr./lat.)	**Protection status according to**						
	IUCN Red List	European red list	The Red Book of Ukraine	Berne Convention	The Bonn Convention	CITES list	Regional Red Lists

Control questions:

1. Name the international documents on the protection of animal species.
2. What is the IUCN Red List and the European Red List?
3. What is the structure of the Red Data Book of Ukraine? Name the purpose, essence and functions of the Red Data Book of Ukraine.
4. What are the similarities and differences between the IUCN Red List, the European Red List and the Red Data Book of Ukraine?
5. What is the difference between the organization of plant protection and the organization of animal protection?

Practical work № 10

Topic: Preparation of proposals for the protection obligation of the territory proposed for granting the protected status.

Aim: to acquire practical skills in drawing up a protection obligation for the territory of the object of the Nature Reserve Fund.

Task: to prepare proposals for the protection of the territory of the proposed object of the Nature Reserve Fund.

Instruments and materials: materials of scientific substantiation, scientific publications.

Brief theoretical information

The protection obligation is the final stage of documenting the territory after it is declared and established in kind. Thus, it should contain the following information: location of the territory, map, description of species and their protection status, subordination, status of the territory and its category, and protection proposals. It is the proposals for protection that can be further reviewed during the inventory, so they should be clearly aimed at preserving the species and habitat. Unfortunately, attempts to give a territory a high conservation status often have the opposite effect over time. Therefore, a complete ban on any human activity should be avoided and such a ban should be proposed only where it is feasible. Particular attention should be paid to scientific research on the area, as research on the species always focuses on threat factors. Often, it is human activity that contributes to the stabilization of populations. For example, haymaking and grazing contribute to the natural cycles of certain plant species, and a complete ban on such human activities endangers rare and endangered species (e.g., the «Narcissus Valley» tract of the Carpathian Biosphere Reserve). Preserving exotic, unique plants is an extremely difficult task, as these are living objects that are prone to death caused by age. This phenomenon is often observed in the category of "monuments of landscape art", where trees, reaching their maximum size and age,

not only lose their aesthetic value, but also create certain inconveniences and sometimes threats to the population. Preserving the integrity of such objects is possible only by replacing the retiring trees of the maximum age with young trees of the same species.

Work progress

Based on the skills acquired during the previous practical work, prepare a draft of the protection obligation of the territory of the proposed object of the Nature Reserve Fund according to Appendix B. In paragraph 1 of the protection obligation, indicate the legal grounds for the creation or declaration of this object of the Nature Reserve Fund. In paragraph 2, indicate the subordination of the object; specify the category, name, area and location of the territory (object). In part 4, "Protected Area Regime", indicate the types of activities that are prohibited in the area. The work is performed on the basis of materials selected by the teacher.

Control questions:

1. What information is the basis for the formation of a security obligation?
2. To whom can an object of the Nature Reserve Fund be subordinated?
3. For which categories of objects of the Nature Reserve Fund are the protection obligations made?
4. What mandatory information should be contained in the protection obligation?
5. How often should the protection obligation be reviewed?
6. Does the security undertaking include human activity?

Practical work № 11

Topic: Determination of the type and status of the projected object of the Nature Reserve Fund.

Aim: to acquire practical skills in determining the type and status of nature reserve objects.

Task: based on the materials provided, determine the type and status of the projected object of the Nature Reserve Fund.

Instruments and materials: Law of Ukraine "On the Nature Reserve Fund" (current version).

Brief theoretical information

Establishing the status and type of the territory proposed for protection is an important stage in the establishment and further functioning of a protected area. It is easier with natural monuments, monuments of landscape art, because the object of protection is clearly defined (trees, a single tree, parks, rocks, waterfalls, etc.). Other categories, starting with nature reserves, are more complicated, especially if the object of protection is animals. It should be noted that since 2016, the Law of Ukraine "On the Nature Reserve Fund" has been amended to some extent to eliminate the division of the objects of the Nature Reserve Fund into types, since any economic activity on the territories of the Nature Reserve Funds is prohibited. Previously, haymaking was allowed on the territory of a zoological reserve, but now this type of management is de jure prohibited. However, the definition of the type of nature reserve object remained the same. Thus, if flora predominates among the species found in the area to be protected, it will certainly have a botanical, dendrological or forest type. If fauna species predominate, then there may be types according to taxa accepted in zoology: entomological, ornithological, batrachological, etc.

The situation with determining the status, or rather legal subordination, is more clear. Of course, there are attempts to obtain the highest possible status for the territory, but the main idea here is to create conditions for the conservation of

rare and endangered species and their habitats. De facto, small territories, despite being granted a high status at the national level, do not have proper protection. Therefore, conceptually, scientists are moving towards the creation of small-sized objects of low status, which are subsequently combined and included in the objects of the Nature Reserve Fund of high rank (Regional Landscape Parks, Forest Plantations, National Nature Parks, etc.). Thus, a successful determination of the type and status of the territory of the object proposed for conservation is a guarantee of its full functioning.

Work progress

Based on the skills acquired during previous practical work and the Law of Ukraine "On the Nature Reserve Fund" [28], determine the status of the projected object of the Nature Reserve Fund. Use the following algorithm to determine this:

1. The first step is to establish the category of the object of the Nature Reserve Fund, which includes natural and artificial natural complexes. The natural ones include: nature reserve, biosphere reserve, national nature park, regional landscape park, nature reserve, natural monument, protected tracts; the artificial ones include: botanical gardens, dendrological parks, zoological parks, natural monuments, parks-monuments of landscape art.
2. Next, if the category of the object is a reserve or a natural monument, its type is determined: for a reserve it can be: landscape, forest, botanical, general zoological, ornithological, entomological, ichthyological, hydrological, general geological, paleontological, karst and speleological; for natural monuments: complex, botanical, zoological, hydrological, geological, virgin forest. The determining factor here will be the object of protection that is proposed to be protected.
3. The final step is to determine the status of the object: international, national or local significance. For this purpose, the criteria given in the previous case studies should be used.

Control questions:

1. Name the current classification of objects of the nature reserve fund of Ukraine.
2. What categories of objects of the Nature Reserve Fund are natural?
3. What categories of objects of the Nature Reserve Fund are artificial?
4. How are the objects of the Nature Reserve Fund classified by type?
5. What categories of objects of the Nature Reserve Fund may have the status of local importance.
6. What categories of objects of the Nature Reserve Fund can have the status of national importance?

ГЛОСАРІЙ – GLOSSARY

АВТОХТОН – представник групи, етногенез якої відбувався на даній території.

AUTOCHTON – the representative of the group, which ethnogenesis occurred on the named territory.

АГРЕГАЦІЯ ВОДНА – з'єднання в одне ціле живих організмів (одного або різних видів) гідроекосистеми, скупчення вільноплаваючих біонтів.

AQUATIC AGGREGATION – the connection of each living organisms (of the same or different species) of the given hydroecosystem, an avvumulation of free-swimming bionts.

АДАПТАЦІЯ – сукупність пристосувань, реакцій живої системи (організму, популяції, виду, біоценозу), спрямованих на підтримку функціональної стабільності за зміни умов зовнішнього середовища, а також до сумісного співіснування в екосистемах певного типу. А. сприяє можливості існування окремих індивідів упродовж онтогенезу, а також збереженню виду.

ADAPTATION – a set of adjustments, that a living system (ab organism, population, species or biocenosis) does to aim maintaining fumctional stability under changes in environmental conditions, as well as compatiblr coexistence in a certain types of ecosystem. It contributes to the possibility of the existence of idividuals during ontogenesis, as well as the preservation of the species.

АДАПТОГЕНЕЗ – виникнення, розвиток і перетворення пристосувань (адаптацій) у процесі еволюції організмів.

ADAPTOGENESIS – the emergence, development and transformation of adjustments (adaptations) in the process of evolution of organisms.

АКЛІМАТИЗАЦІЯ – пристосування організмів до нових умов існування, в які вони потрапляють природним шляхом, або переносяться (свідомо чи випадково) людиною. А. включає пристосування до кліматичних, фізико-хімічних, ґрунтових умов нового середовища та до нових біоценозів. Це пристосування відбувається внаслідок не спадкових змін норми реакції організмів, характеру та інтенсивності обміну речовин або під впливом природного добору шляхом зміни генетичної структури виду (справжня А.). Розрізняють декілька ступенів А.: 1 ступінь – здатність однорічних тропічних рослин (наприклад, баклажан) розвиватись і плодоносити у культурі; здатність тропічних тварин (австралійський страус та ін.) жити цілий рік на відкритому

повітрі помірного клімату (напр., у зоопарках); 2 рівень – здатність переселених рослин та тварин жити постійно в нових природних умовах при ретельному догляді людини (катальпа бігонієвидна, нутрія);

3 рівень – здатність рослин (клен червоний та ін.) та тварин (норка американська) розвиватись і розмножуватись у нових умовах не гірше, ніж місцеві форми; 4 рівень – здатність акліматизованого виду розмножуватись швидше в новому середовищі існування аж до витіснення місцевих форм (елодея та колорадський жук в Європі та ін.).

ACCLIMATIZATION – adaptation of organisms to new conditions of existence, into which they fall naturally, or are transferred (consciously or accidentally) by a person. A. includes adaptation to the climatic, physico-chemical, soil conditions of the new environment and adapt. to new biocenoses. This adaptation occurs as a result of non-hereditary changes in the rate of reaction of organisms, the nature and intensity of metabolism, or under the influence of natural selection by changing the genetic structure of the species (true A.). There are several degrees of A.: 1st degree – the ability of yearling tropical plants (for example, eggplant) to develop and bear fruit in culture; the ability of tropical animals (Australian ostrich, etc.) to live year-round outdoors in a temperate climate (e.g., in zoos); 2nd degree – the ability of resettled plants and animals to live permanently in new natural conditions with thorough human care (*catalpa bignonioides*, nutria);

3rd degree – the ability of plants (red maple, etc.) and animals (American mink) to evolve and reproduce in new conditions no worse than local forms; 4th degree – the ability of an acclimatized species to reproduce faster in a new habitat up to the displacement of local forms (elodea and Colorado potato beetle in Europe, etc.).

АНТРОПОГЕННЕ НАВАНТАЖЕННЯ – ступінь впливу людини та її діяльності на природу. А.н. включає:

1) використання ресурсів популяцій видів, що входять до складу екосистем (полювання, рибалка, заготівля лікарських рослин, вирубка дерев),

2) випасання худоби,

3) рекреаційний вплив,

4) забруднення водойм (скидання промислових, побутових та сільськогосподарських стоків),

5) випадіння з атмосфери зважених твердих часток або кислотних дощів та ін. Якщо А.н. змінюється щорічно, то вона може спричинювати флуктуації екосистем. При постійному впливі на екосистеми А.н. спричинює екологічні сукцесії. При раціональному природокористуванні А.н. регулюється через екологічне нормування до рівня, безпечного для екосистем.

ANTHROPOGENIC LOAD – the degree of influence of mankind and it’s

activities on nature. A.l. includes:

1) exploitation of resources of populations of species that are a part of ecosystems (e.g. hunting, fishing, harvesting medicinal herbs, deforestation etc.),

2) livestock grazing,

3) recreational influence,

4) water pollution (discharge of industrial, domestic and agricultural effluents),

5) precipitating from the atmosphere of suspended solid particles or acid rain, etc. If A.l. changes annually, it can cause ecosystem fluctuations. With constant influence on the ecosystems of A.n. causes ecological successions. With rational nature management, A.l. is regulated through environmental regulation to a level that is safe for ecosystems.

БІОСФЕРА [від гр. bios – життя, sphaira – куля] – одна з оболонок (сфер) Землі, склад і енергетика якої в істотних своїх рисах визначені роботою живої речовини.

Термін Б. ввів у науку Е. Зюсс (1875). Пізніше, завдяки працям В.І. Вернадського, цей термін став позначати всю зовнішню область планети Земля, в якій не тільки існує життя, але яка в тій чи іншій мірі видозмінена чи сформована життям: ”Жизнь захватывает значительную часть атомов, составляющих материю земной поверхности. Под ее влиянием эти атомы находятся в непрерывном, интенсивном движении. Из них все время создаются миллионы разнообразнейших соединений. И этот процесс длится без перерыва десятки миллионов лет, от древнейших археозойских эр до нашего времени. На земной поверхности нет химической силы, более постоянно действующей, а потому и более могущественной по своим конечным последствиям, чем живые организмы, взятые в целом” (праця ”Біосфера”).

У складі Б. розрізняють **необіосфер**у та **палеобіосферу** (складає поклади корисних копалин). Сучасна Б. – необіосфера – складна система, що складається з багатьох компонентів, які включають всю живу та неживу (середовище помешкання) природу. Б. має потужність 30–40 км і включає частину атмосфери – тропосферу (до висоти 20–22 кілометри – спори деяких бактерій і пліснявих грибів), гідросферу (від поверхні до глибини 10–11 кілометрів), верхню частину літосфери (до глибини 5 кілометрів), взаємопов'язані біогеохімічними циклами міграції речовин та енергії. У межах біосфери виділяють **біогеосферу** – оболонку Землі, де сконцентрована жива речовина планети. На відміну від Б. біогеосфера - це тільки область високої концентрації живих організмів, розміщена на межі поверхні земної кори з атмосферою та у верхній частині водної оболонки, займаючи шар товщиною

від декількох метрів (тундра, степ, пустеля) до сотень метрів (ліси, моря).

Стосовно ієрархії рівнів організації живої матерії і системного підходу Б. – сукупність всіх екосистем (біогеоценозів). Всі екологічні ніші, придатні для життя, зайняті Б., яка виникла одночасно з появою життя на Землі (близько 4 млрд. років тому) у вигляді примітивних протобіоценозів у первинному Світовому океані. Близько 450 млн. років тому живі організми почали заселяти сушу, де їх еволюція (можливо, в силу більш жорстких, ніж в океані, екологічних умов) прискорилася, і, в результаті, співвідношення числа видів тварин і рослин в Світовому океані і на суші складає приблизно 1: 5. Основними факторами еволюції Б. є: абіотичні (геологічні, космічні), біотичні (мінливість, тобто мутації, спадковість, боротьба за існування, природний добір), а також антропогенні. *Синонім: Екосфера.*

BIOSPHERE [from gr. bios – life, sphaira – sphere] – one of the zones (spheres) of the Earth, the composition and energy of which are determined in their essential features by the work of living matter.

The term B. was introduced into science by E. Suess (1875). Later, thanks to the works of V.I. Vernadskyi, this term began to denote the entire outer region of the planet Earth, in which not only life exists, but which is to one way or another modified or formed by life: "Life captures a significant part of the atoms that make up the matter of the earth's surface. Under its influence, these atoms are in continuous, intense motion. Millions of the most diverse compounds are created from them all the time. And this process continues without interruption for tens of millions of years, from the earliest Archaeozoic eras to our time. There is no chemical force on the earth's surface more constantly acting, and therefore more powerful in its final consequences, than living organisms taken as a whole" (work "Biosphere").

The **neobiosphere** and the **paleobiosphere** (contains mineral deposits) are distinguished as part of B. Modern B. – neobiosphere – a complex system consisting of many components that include all living and non-living (residential environment) nature. B. has a thickness of 30–40 km and includes part of the atmosphere – the troposphere (up to a height of 20–22 kilometers – spores of some bacteria and molds), the hydrosphere (from the surface to a depth of 10–11 kilometers), the upper part of the lithosphere (up to a depth of 5 kilometers), interconnected by biogeochemical cycles of migration of substances and energy. Within the biosphere, the biogeosphere is distinguished – the Earth's shell, where the planet's living matter is concentrated. In contrast to B., the biogeosphere is only an area of high concentration of living organisms, located at the boundary of the surface of the earth's crust with the atmosphere and in the upper part of the water shell, occupying a layer with a thickness of several meters (tundra, steppe, desert) to hundreds of

meters (forests, seas).

Regarding the hierarchy of levels of the organization of living matter and the systemic approach, B. is the totality of all ecosystems (biogeocenoses). All ecological niches suitable for life are occupied by B., which arose simultaneously with the appearance of life on Earth (about 4 billion years ago) in the form of primitive protobiocenoses in the primary World Ocean. About 450 million years ago, living organisms began to inhabit land, where their evolution (perhaps due to harsher environmental conditions than in the ocean) accelerated, and, as a result, the ratio of the number of animal and plant species in the World Ocean and on land is approximately 1: 5. The main factors of B.'s evolution are: abiotic (geological, cosmic), biotic (variability, that is, mutations; heredity; battle for existence, natural selection), as well as anthropogenic. *Synonym: Ecosphere*.

БІОСФЕРНИЙ ЗАПОВІДНИК – природоохоронна науково-дослідна установа міжнародного значення, створена з метою збереження в природному стані найтиповіших природних комплексів біосфери, здійснення фонового екологічного моніторингу, вивчення природного середовища, його змін під дією антропогенних факторів. Для Б.з. встановлюється диференційований режим охорони, відтворення та використання природних комплексів згідно з функціональним зонуванням.

BIOSPHERE RESERVE – a nature protection research institution of international importance, created with the aim of preserving the most typical natural complexes of the biosphere in their natural state, carrying out background ecological monitoring, studying the natural environment, its changes under the influence of anthropogenic factors. For B.r. a differentiated mode of protection, reproduction and use of natural complexes is established in accordance with functional zoning.

БІОСФЕРНИЙ РЕЗЕРВАТ – територія, яка є частиною світової мережі біосферних резерватів в рамках Програми ЮНЕСКО «Людина і біосфера». Виконує такі функції: природоохоронну (збереження генетичних ресурсів, видів, екосистем і ландшафтів), розвитку (сприяння сталому розвиткові суспільства) і логістичну (підтримка демонстраційних проектів, екологічна освіта, наукові дослідження з питань охорони природи і сталого розвитку).

BIOSPHERE RESERVE – a territory that is part of the world network of biosphere reserves within the framework of the UNESCO Program "Man and the Biosphere". Performs the following functions: environmental protection (preservation of genetic resources, species, ecosystems and landscapes), development (promoting the sustainable development of society) and logistics (supporting demonstration projects, environmental education, scientific research on

nature protection and sustainable development).

БІОТА [від грецьк. biote – життя] – історично сформована сукупність організмів, об'єднаних загальною областю поширення; сукупність флори и фауни певної території.

BIOTA [from Greek biote – life] – a historically formed set of organisms united by a common area of distribution; set of flora and fauna of a certain territory.

БІОТЕХНОЛОГІЯ – будь-який вид технології, пов'язаний з використанням біологічних систем, живих організмів або їх похідних для виготовлення або поліпшення продуктів або процесів з метою їх конкретного використання (Конвенція про біологічне різноманіття).

BIOTECHNOLOGY – any type of technology related to the use of biological systems, living organisms or their derivatives for the manufacture or improvement of products or processes for the purpose of their specific use (Convention on Biological Diversity).

БІОТИЧНИЙ – властивий живим організмам, вироблений або обумовлений живою істотою (фактор, вплив, зв'язок, середовище тощо).

BIOTIC – inherent to living organisms, produced or caused by a living being (factor, influence, connection, environment, etc.).

БІОТОП [від гр. bios – життя, topos – місце] – найменша просторова одиниця з однотипними умовами рельєфу, клімату та інших абіотичних факторів; ділянка території, однорідна за умовами життя для певних видів рослин або тварин або для формування певного біоценозу. Основні біотопи Землі: моря і океани – 71%; гори і пустелі – 16%; льодовики, джунглі, ліси – 8%; грунти, придатні для обробки – 5%. *Синонім: Екотоп.*

BIOTOP [from gr. bios – life, topos – place] – the smallest spatial unit with the same types of terrain, climate and other abiotic factors; a section of the territory, homogeneous in terms of living conditions for certain species of plants or animals or for the formation of a certain biocenosis. The main biotopes of the Earth: seas and oceans – 71%; mountains and deserts – 16%; glaciers, jungles, forests – 8%; soils suitable for processing – 5%. *Synonym: Ecotop*.

БІОЦЕНОЗ – сукупність живих істот (рослин, тварин, грибів, мікроорганізмів) у межах однієї екосистеми або біогеоценозу, взаємопов’язаних біотичними зв’язками і певним, створеним ними, біоценотичним середовищем.

BIOCENOSIS – a set of living beings (plants, animals, fungi, microorganisms), coexisting within one ecosystem or biogeocenosis, interconnected by biotic connections and a certain biocenotic environment created by them.

БІОЦЕНОЗ [от гр. bios – життя, koinos – спільний], або спільнота – група організмів різних видів рослин, грибів, тварин і мікроорганізмів, існуючих у тому ж самому місці помешкання та взаємодіючих через трофічні (харчові) та просторові взаємовідносини між собою і з середовищем. Термін введено німецьким біологом К. Мебіусом (1877). Біоценоз – комплекс організмів біогеоценозу, який формується як наслідок боротьби за існування, природного добору та інших факторів еволюції. За участю в біологічному кругообігу речовин у біоценозі розрізняють три групи організмів: продуценти, консументи, редуценти. За систематичною ознакою біоценоз складається з фітоценозу, зооценозу, мікоценозу, мікробоценозу.

BIOCENOSIS [from gr. bios – life, koinos – common], or community – a group of organisms of various types of plants, fungi, animals, and microorganisms existing in the same place of residence and interacting through trophic (food) and spatial relationships among themselves and with the environment. The term was introduced by the German biologist K. Mobius (1877). Biocenosis is a complex of organisms of biogeocenosis, which is formed as a result of the struggle for existence, natural selection, and other factors of evolution. Three groups of organisms are distinguished by their participation in the biological cycle of substances in biocenosis: producers, consumers, and reducers. According to a systematic feature, biocenosis consists of phytocenosis, zoocenosis, mycocenosis, and microbocenosis.

БІОЦЕНОЗ НАСИЧЕНИЙ – біоценоз з повним, максимальним набором видів рослин і тварин, в якому немає місця для мігрантів (екваторіальні тропічні ліси, широколистяні ліси помірних широт, інші природні спільноти). Б.Н. характеризується високим ступенем стабільності.

SATURATED BIOCENOSIS – a biocenose with a complete, maximum set of plant and animal species, in which there is no place for migrants (equatorial tropical forests, broad-leaved forests of temperate latitudes, other natural communities).
S.b. is characterized by a high degree of stability.

БІОЦЕНОЗ НЕНАСИЧЕНИЙ – біоценоз зі збідненим набором популяцій, в який, як правило, можуть безперешкодно проникати інші види організмів. Ненасиченість характерна для агроценозів, уразливих для шкідників і бур'янів.

UNSATURATED BIOCENOSE – a biocenosis with an impoverished set of populations, into which, as a rule, other types of organisms can penetrate without hindrance. Unsaturation is characteristic of agrocenoses, vulnerable to pests and weeds.

БІОЦИКЛ – найбільший ділянка біосфери. Розрізняють три Б.: суходіл, море і внутрішні водойми. У свою чергу Б. поділяються на біохори – сукупність подібних біотопів (наприклад, Біохор пустель).

BIOCYCLE – the largest part of the biosphere. There are three B.: land, sea, and inland water bodies. In turn, B. is divided into biochores – a set of similar biotopes (for example, Biochor of deserts).

БОНІТЕТ [від лат. bonitas – доброякісність] – економічно значима характеристика господарсько-цінної групи об'єктів або угідь, що відрізняє їх від інших подібних утворень (Б. лісу, Б. ґрунту).

BONITET [from lat. bonitas – good quality] – an economically significant characteristic of an economically valuable group of objects or lands, which distinguishes them from other similar formations (forest B., soil B.).

БОНІТУВАННЯ ГРУНТУ – порівняльна характеристика якості земельних угідь (в балах) на основі ґрунтових обстежень. Необхідна для економічної оцінки земель, ведення земельного кадастру, меліорації і т.п.

SOIL BONITED GRADING – comparative characteristics of land quality (in points) based on soil surveys. Necessary for the economic assessment of land, maintaining the land cadastre, land reclamation, etc.

БОТАНІЧНИЙ САД – науково-дослідна, навчальна і культурно- освітня установа, зібрання колекцій живих рослин, метою якого є збереження, вивчення, акліматизація, розмноження в спеціально створених умовах та ефективне господарське використання рідкісних і типових видів місцевої и світової флори. В Б.с. створюються, поповнюються та зберігаються ботанічні колекції, проводиться наукова, навчально-освітня робота. В Б.с. організована охорона рослин на популяційно-видовому рівні. В Україні налічується більше 25 Б.с.

BOTANICAL GARDEN – a research, educational, and cultural institution, a collection of living plants, the purpose of which is the preservation, study, acclimatization, reproduction in specially created conditions and effective economic use of rare and typical species of local and world flora. In B.g. botanical collections are created, replenished and preserved; scientific, educational work is carried out. In

B.g. organized plant protection at the population and species level. In Ukraine, there are more than 25 B.g.

БУЛЬБОЧКОВІ БАКТЕРІЇ – рід азотфіксуючих бактерій, що утворюють бульби на коренях багатьох бобових рослин. Поглинають атмосферний молекулярний азот і переводять його в азотні сполуки, засвоювані рослинами, які, в свою чергу, забезпечують інші рослини поживними речовинами.

NODULE BACTERIA – a genus of nitrogen-fixing bacteria that form nodules on the roots of many leguminous plants. Atmospheric molecular nitrogen is absorbed and converted into nitrogen compounds assimilated by plants, which, in turn, provide other plants with nutrients.

"БУМЕРАНГ ЕКОЛОГІЧНИЙ" – вираз для позначення скрутній ситуації, викликаної недотриманням екологічних законів, у результаті чого вплив на природу, що здійснюється людиною, обертається проти неї.

"ENVIRONMENTAL BOOMERANG" – an expression used to denote a difficult situation caused by non-compliance with environmental laws, as a result of which human influence on nature turns against it.

БРАКОНЬЄРСТВО – добування або знищення диких тварин з порушенням правил мисливства, рибальства, лісопорушення, незаконне збирання рідкісних і цінних рослин та недотримання вимог законодавства щодо охорони тваринного світу.

POACHING – obtaining or destroying wild animals in violation of the rules of hunting, fishing, deforestation, illegal collection of rare and valuable plants, and non-compliance with the requirements of the legislation on the protection of the animal world.

БУФЕРНА ЗОНА – місцевість з природним або частково зміненим станом ландшафту навколо найцінніших ділянок екомережі, яка захищає їх від дії зовнішніх негативних чинників природного походження або спричинених діяльністю людини.

BUFFER ZONE – an area with a natural or partially altered state of the landscape around the most valuable areas of the eco-network, which protects them from the action of external negative factors of natural origin or caused by human activity.

БУФЕРНІСТЬ ЕКОСИСТЕМ – здатність екосистеми протистояти

антропогенним та іншим негативним впливам, зберігаючи свої основні властивості в безпечних межах.

BUFFERING OF ECOSYSTEMS – the ability of an ecosystem to resist anthropogenic and other negative impacts, keeping its main properties within safe limits.

БУФЕРНІСТЬ ПОПУЛЯЦІЇ – здатність популяції до компенсації втрат, зумовлених несприятливими змінами навколишнього середовища.

BUFFERING CAPACITY OF THE POPULATION – the ability of the population to compensate for losses caused by adverse changes in the environment.

ВИДОВЕ БАГАТСТВО – кількість видів всієї біоти або певної її частини (судинних рослин, мохів, лишайників, водоростей, грибів, нематод, комах, птахів і т. д.) на певній площі; простий показник, що відображає біологічне різноманіття. Для дрібних організмів (мохи, ґрунтові безхребетні) видове багатство оцінюється на площі від 0,01 до 1 м^2, для дерев і птахів – на площі від 100 м^2 до 1 км^2, для великих тварин (лев, тигр, слон, жираф) використовують площі обліку в десятки квадратних кілометрів.

SPECIES RICHNESS – the number of species of the entire biota or a certain part of it (vascular plants, mosses, lichens, algae, fungi, nematodes, insects, birds, etc.) on a certain area; a simple indicator reflecting biological diversity. For small organisms (moss, soil invertebrates) species richness is estimated on an area from 0.01 to 1 m^2, for trees and birds – on an area from 100 m^2 to 1 km^2, for large animals (lion, tiger, elephant, giraffe) areas are used accounting for dozens of square kilometers.

ВИДІЛ – (первинна лісогосподарська облікова одиниця) – ділянка з визначеними межами, однорідна за своїм господарським значенням і таксаційною характеристикою, що відрізняється від таксаційних характеристик суміжних ділянок на величину, визначену організаційно-розпорядчими документами лісовпорядної організації, і потребує здійснення на всій своїй площі однакових лісогосподарських заходів.

UNIT (primary forestry accounting unit) – a plot with defined boundaries, homogeneous in terms of its economic value and tax characteristics, which differs from the tax characteristics of adjacent plots by the amount determined by the organizational and management documents of the forest management organization, and requires the implementation of the same forestry measures on its entire area measures.

ВИМИРАННЯ ОРГАНІЗМІВ – часткове або цілковите знищення окремих організмів, таксону або цілих видів флори і фауни певної території чи акваторії внаслідок еволюційних процесів або непередбаченого опосередкованого впливу людини.

EXTINCTION OF ORGANISMS – partial or complete destruction of individual organisms, taxa, or entire species of flora and fauna of a certain territory or water area as a result of evolutionary processes or unforeseen indirect human influence.

ВИСНАЖЕННЯ ПРИРОДНИХ РЕСУРСІВ – зменшення кількості та зниження якості природних ресурсів під впливом господарської діяльності людини до рівня, коли порушується рівновага, що забезпечує стійкість природного середовища і життя на Землі, або коли добування й переробка ресурсів стають економічно нерентабельними. Глобальне виснаження деяких природних ресурсів може спричинити екологічну катастрофу. Основним запобіжним заходом є перехід на засади сталого розвитку.

DEPLETION OF NATURAL RESOURCES – decrease in the quantity and quality of natural resources under the influence of human economic activity to the level when the balance that ensures the stability of the natural environment and life on Earth is disturbed, or when the extraction and processing of resources become economically unprofitable. The global depletion of some natural resources can cause an ecological catastrophe. The main preventive measure is the transition to the principles of sustainable development.

ВИРУБКА – ділянка лісу, на якій у результаті лісозаготівлі знищено деревостій. Таке втручання у життя лісової екосистеми різко змінює умови середовища: покращується освітленість та забезпеченість елементами ґрунтового живлення (за рахунок гниття коренів та залишків деревини), що провокує різку зміну складу біоти.

На вирубках відбуваються відновлювальні екологічні сукцесії, характер яких визначається типом лісу, розміром площі вирубки, способом рубки (вибіркова чи суцільна), технологією процесу (спалювання залишків від рубки, розкидування по площі та ін.), забезпеченням діаспорами (насіння рослин, спори мохів, вегетативні зачатки), а також подальшим використанням вирубки (випас, сінокіс).

На першій стадії відновлення лісу внаслідок збагачення грунту залишками дерев, що розкладаються, і покращення режиму зволоження ґрунту (через припинення випаровування вологи кронами зрубаних дерев) розвивається високотрав'я.

Надалі через ряд стадій відновлюється екосистема початкового типу. При відновленні деяких типів лісу (наприклад, ялинників) сукцесія відбувається через стадію рослин – «нянь» (вільхи, берези, верби). При інтенсивному сінокісному або пасовищному використанні вирубки на ній розвиваються спільноти лугів. Задача раціонального лісокористування – сприяти природному відновленню лісу на вирубці. Для цього під час рубки лісу зберігають окремі дерева, які слугують джерелами насінин для відновлення деревостою. Використовуються більш екологічні методи рубки та вивозу деревини, які не порушують ґрунтового покриву. У деяких випадках на вирубках проводять лісопосадки, що значно дорожче за природне відновлення дерев. На вирубках має бути виключене випасання худоби.

CLEARING – a forest area where the tree stand has been destroyed as a result of logging. Such an intervention in the life of the forest ecosystem dramatically changes the environmental conditions: the illumination and supply of soil nutrients improves (due to the rotting of roots and wood residues), which provokes a sharp change in the composition of the biota.

Regenerative ecological successions take place on fellings, the nature of which is determined by the type of forest, the size of the felling area, the method of felling (selective or continuous), the technology of the process (burning residues from felling, scattering over the area, etc.), provision of diaspores (plant seeds, moss spores, vegetative beginnings), as well as further use of felling (grazing, haymaking).

At the first stage of forest restoration, as a result of enriching the soil with the remains of decomposing trees and improving the soil moisture regime (due to the cessation of moisture evaporation by the crowns of felled trees), tall grass develops.

In the future, through a series of stages, the ecosystem of the original type is restored. When restoring some types of forest (for example, Christmas trees), succession takes place through the stage of "nurse" plants (alders, birches, willows). With intensive haymaking or pasture use, meadow communities develop on it. The task of rational forest use is to promote the natural regeneration of the forest on felling. To do this, during the felling of the forest, individual trees are kept, which serve as sources of seeds for tree regeneration. More ecological methods of felling and removal of wood are used, which do not disturb the soil cover. In some cases, afforestation is carried out on felled areas, which is much more expensive than the natural regeneration of trees. Livestock grazing should be excluded from the fellings.

ВИСНОВОК ДЕРЖАВНОЇ ЕКОЛОГІЧНОЇ ЕКСПЕРТИЗИ – документ, підготовлений експертною комісією державної екологічної експертизи, що містить обґрунтовані висновки про допустимість впливу на

навколишнє природне середовище господарської та іншої діяльності, яка підлягає державній екологічній експертизі, і про можливість реалізації об'єкта державної екологічної експертизи, схвалений кваліфікованою більшістю облікового складу зазначеної експертної комісії і такий, що відповідає завданням на проведення екологічної експертизи, що видається спеціально уповноваженим державним органом у сфері екологічної експертизи.

CONCLUSION OF THE STATE ENVIRONMENTAL EXPERTISE – a document prepared by the expert commission of the state ecological expertise, which contains substantiated conclusions about the admissibility of the impact on the natural environment of economic and other activities that are subject to the state ecological expertise, and about the possibility of implementing the object of the state ecological expertise, approved by a qualified majority accounting staff of the specified expert commission and one that corresponds to the task of carrying out environmental expertise, which is issued by a specially authorized state body in the field of environmental expertise.

ВІДЕНСЬКА КОНВЕНЦІЯ ПРО ОХОРОНУ ОЗОНОВОГО ШАРУ – міжнародний правовий документ (1985), прийнятий в м. Відні (Австрія) і є першим міжнародним нормативним актом з охорони озонового шару.

The **VIENNA CONVENTION ON THE PROTECTION OF THE OZONE LAYER** – an international legal document (1985) adopted in Vienna (Austria) and is the first international normative act on the protection of the ozone layer.

ВІДТВОРЮВАЛЬНА ДІЛЯНКА – частина території мисливських угідь, що визначається користувачем з метою забезпечення охорони та відтворення мисливських тварин. Порядок визначення відтворювальних ділянок (територій для охорони та відтворення мисливських тварин) затверджується центральним органом виконавчої влади, який забезпечує формування та реалізацію державної політики у сфері мисливського господарства.

REPRODUCTION AREA – a part of the territory of hunting grounds defined by the user to ensure the protection and reproduction of hunting animals. The procedure for determining reproduction areas (territory for the protection and reproduction of hunting animals) is approved by the central executive body, which ensures the formation and implementation of state policy in the field of hunting.

ВІЙСЬКОВИЙ ЕКОЦИД (екологічна зброя) – порушення екосистем як середовища існування людини у ході військових дій.

Військовий екоцид супроводжують будь-які військові дії, однак, у

багатьох випадках при вирішенні військових завдань встановлювалося спеціальне завдання руйнування середовища мешкання населення супротивника. Першими військовий екоцид застосували у 146 р. римляни, які при руйнування Карфагену засипали землю сіллю, щоб її не можна було використовувати для землеробства. Однак, найбільш крупними акціями військового екоциду було застосування дефоліантів під час війни в Індокитаї (1964 – 1970 рр.) та нафтове забруднення Іраком атмосфери, ґрунтів та Персидської затоки під час ірако–кувейтської війни (1991 р.).

Військові сили США у 1960-х рр. розпилювали на території В'єтнаму та Камбоджі більше 100 тис. тонн різноманітних хімікатів–дефоліантів, у складі яких була речовина, що впливає на дерева – арборицид 2,4,5–Т з домішками диоксидів. У результаті були знищені тропічні ліси на площі 2 млн. га та 43% площі сільськогосподарських угідь В'єтнаму. Різко збіднилася фауна (наприклад, зі 160 видів птахів у районах, що були піддані обробці дефоліантами, збереглось менше 20). На оброблених дефоліантами ґрунтах ліс зовсім не відновлюється і розростається двометровий злак слонова трава, або відновлюються малоцінні вторинні породи дерев.

Під час ірако–кувейтської війни іракці підірвали 1200 нафтових свердловин, ряд нафтопроводів, нафтосховищ та затопили кувейтські танкери. Пожежі, що виникали, за масштабами не мали прецедентів в історії людства. Щодня вигорало приблизно 1 млн. тонн нафти, в атмосферу викидалось при цьому 50 тис. тонн діоксиду сірки, 100 тис. тонн сажі та 80 тонн діоксиду вуглецю. В результаті задимленості атмосфери температура в районах активних бойових дій знизилась на 10 градусів. Чорні дощі йшли в радіусі 1000 км, що знизило продуктивність сільськогосподарських угідь та викликало масові захворювання населення. На поверхню затоки було вилито до 400 тонн нафти, нафтова пляма у Персидській затоці виникла на площі 10 тис. км^2. Значних збитків було нанесено екосистемам затоки та прибережних територій, де спостерігалася масова загибель птахів (бакланів, пеліканів та ін.).

MILITARY ECOCIDE (ecological weapon) – violation of ecosystems as human habitat during military operations.

Military ecocide is accompanied by any military actions, however, in many cases, when solving military tasks, a special task of destroying the enemy's population's habitat was established. The first to use military ecocide in 146 were the Romans, who, during the destruction of Carthage, covered the land with salt so that it could not be used for agriculture. However, the largest acts of military ecocide were the use of defoliants during the Indochina War (1964–1970) and Iraq's oil pollution of the atmosphere, soil, and the Persian Gulf during the Iraq-Kuwait War (1991).

In the 1960s, the US military sprayed more than 100,000 tons of various defoliant chemicals on the territory of Vietnam and Cambodia, which included a substance that affects trees – arboricide 2,4,5–T with dioxide impurities. As a result, 2 million hectares of tropical forests and 43% of Vietnam's agricultural land were destroyed. Fauna has been severely depleted (for example, out of 160 species of birds in the areas treated with defoliants, less than 20 have survived). On soils treated with defoliants, the forest does not regenerate at all, and a two-meter grass of elephant grass grows, or low-value secondary tree species are regenerated.

During the Iraq-Kuwait war, the Iraqis blew up 1,200 oil wells, several oil pipelines, and oil storage facilities, and sunk Kuwaiti tankers. The fires that broke out had no precedents in the history of mankind in terms of scale. Approximately 1 million tonnes of oil were burned every day, 50,000 tonnes of sulfur dioxide, 100,000 tons of soot, and 80 tonnes of carbon dioxide were released into the atmosphere. As a result of the smoky atmosphere, the temperature in the areas of active hostilities dropped by 10 degrees. Black rains fell in a radius of 1000 km, which reduced the productivity of agricultural lands and caused mass diseases of the population. Up to 400 tonnes of oil were spilled on the surface of the Gulf, and the oil slick in the Persian Gulf was formed on an area of 10,000 km^2. Considerable damage was caused to the ecosystems of the bay and coastal areas, where a mass death of birds (cormorants, pelicans, etc.) was observed.

ВІОЛЕНТ [від лат. violent – шалений] – тип стратегії рослин за Л.Г. Раменським, що відрізняється високою конкурентоспроможністю ("силовики", "леви"). Це – дерева, рідше чагарники і трави з могутнім габітусом і розвиненою кореневою системою, що дозволяють віолентам ставити під контроль ресурси едафічного середовища і світла.

Віоленти домінують на останніх стадіях сукцесії (наприклад, бук у лісі, очерет у дельтах річок).

VIOLENT [from lat. violent – crazy] – a type of plant strategy according to L.G. Ramensky, which is characterized by high competitiveness ("security forces", "lions"). These are trees, less often shrubs and grasses with a powerful habitus and a developed root system, which allow Violents to control the resources of the edaphic environment and light.

Violentes dominate the last stages of succession (for example, beech in a forest, reed in river deltas).

ВІК ЛАНДШАФТУ – відрізок часу, протягом якого ландшафт функціонує в умовах однієї інваріантної структури.

AGE OF THE LANDSCAPE – a period during which the landscape functions

under the conditions of one invariant structure.

ВІКАРИЗМ [від лат. vicarius – взаємний] – взаємна заміна видів у схожих екосистемах, віддалених одна від одної.

VICARISM [from lat. vicarius – reciprocal] – mutual replacement of species in similar ecosystems, distant from each other.

ВІКОВИЙ СКЛАД ПОПУЛЯЦІЇ – співвідношення у популяції особин різного віку. У популяції, що швидко зростає, зазвичай значна доля молоді, а у популяції, чисельність якої скорочується, зазвичай значна частина дорослих та старіючих особин. Якщо чисельність популяції зростає за експоненційним законом (у геометричній прогресії), в ній встановлюється постійний віковий склад або, інакше, стабільна вікова структура. Віковий склад популяції є найважливішою характеристикою популяції людини.

AGE COMPOSITION OF THE POPULATION – the ratio in the population of individuals of different ages. A rapidly growing population usually has a large proportion of young people, and a declining population usually has a large proportion of adults and aging individuals. If the size of the population grows according to an exponential law (in a geometric progression), a constant age composition or, otherwise, a stable age structure is established in it. The age structure of the population is the most important characteristic of the human population.

ВІТАСФЕРА [від лат. vita – життя і гр. sphaire – куля] – шар біосфери, включає всі організми, що нині існують, разом з частиною атмосфери, гідросфери та літосфери, які вони залучають у кругообіг. Потужність вітасфери на суходолі до сотні метрів. Поняття вітасферавідрізняється від поняття географічна оболонка (ландшафтне середовище) і характеризується тим, що не включає в себе геосистеми, де життя практично відсутнє: діючі вулкани, лавові озера, стерильні ділянки вічних льодів та інші абіогенні ландшафти. Основними підрозділами вітасфери є *екоіди* (за Негрі), *екосистеми* (за А. Тенслі), *біогеоценози* (за В.М. Сукачовим).

VITASPHERE [from lat. vita – life and gr. sphaire – sphere] – a layer of the biosphere, that includes all organisms that currently exist, together with part of the atmosphere, hydrosphere, and lithosphere, which they involve in the circulation. The power of the vitasphere on land is up to a hundred meters. The concept of the vitasphere differs from the concept of a geographic shell (landscape environment) and is characterized by the fact that it does not include geosystems where life is practically absent: active volcanoes, lava lakes, sterile areas of eternal ice and other abiogenic landscapes. The main subdivisions of the vitasphere are *ecoids* (according

to Negri), *ecosystems* (according to A. Tensley), and *biogeocenoses* (according to V.M. Sukachev).

ВОДНИЙ ОБЄКТ – зосередження вод на поверхні суші у формах її рельєфу або у надрах, що має межі, об'єм та риси водного режиму (річки та водосховища на них, канали, болота, льодовики, озера, ставки та інші водойми). В.о. – природний або створений штучно елемент довкілля, в якому зосереджуються води (море, лиман, річка, струмок, озеро, водосховище, ставок, канал, а також водоносний горизонт).

WATER OBJECT – a concentration of water on the surface of the land in the forms of its relief or in its interior, which has boundaries, volume, and features of the water regime (rivers and reservoirs on them, canals, swamps, glaciers, lakes, ponds and other bodies of water). Acting – a natural or artificially created element of the environment in which water is concentrated (sea, estuary, river, stream, lake, reservoir, pond, channel, as well as aquifer).

ВОДНИЙ РЕЖИМ – зміна у часі рівнів, витрат та об'ємів води у водних об'єктах.

WATER REGIME – changes over time in levels, flows, and volumes of water in water bodies.

ВОДООХОРОННА ЗОНА – територія, що межує з акваторіями річок, озер, водосховищ та інших поверхневих водних об'єктів, на якій встановлюється спеціальний режим господарської та інших видів діяльності з метою запобігання забруднення, засолення, замулення та виснаження водних об'єктів, а також збереження середовища помешкання об'єктів тваринного та рослинного світу. В.з – смуги 100–300 метрів завширшки, на яких забороняють застосовувати хімічні добрива, пестициди, скидати забруднені стічні води, влаштовувати сміттєзвалища, скотомогильники, будувати промислові підприємства, стоянки автотранспорту, орати землю, випасати худобу. Ці водоохоронні смуги слід засаджувати вербою та вільхою. Лісо-чагарникові насадження зменшують випаровування води з поверхні, притягують вологу з атмосфери, формують дерновий покрив, затримують танення снігу, сприяють переведенню поверхневого стоку в ґрунтовий та підгрунтовий, перешкоджають ерозії берегів, затримують і нейтралізують дисперсні стоки від невеликих населених пунктів, запобігають руйнуванню заплавних природних комплексів, регулюють річковий стік.

WATER PROTECTION ZONE – the territory bordering the water areas of rivers, lakes, reservoirs, and other surface water bodies, on which a special regime of economic and other types of activities is established to prevent pollution,

salinization, siltation and depletion of water bodies, as well as to preserve habitats of objects of the animal and plant world. W.p.z. – strips 100–300 meters wide, on which it is forbidden to use chemical fertilizers, pesticides, discharge polluted sewage, arrange garbage dumps, cattle burial grounds, build industrial enterprises, parking lots for motor vehicles, plow the land, graze livestock. These water protection strips should be planted with willow and alder. Forest and shrub plantations reduce water evaporation from the surface, attract moisture from the atmosphere, form a turf cover, delay the melting of snow, contribute to the transfer of surface runoff to soil and subsoil, prevent bank erosion, retain and neutralize dispersed runoff from small settlements, prevent the destruction of floodplain natural complexes that regulate the river flow.

ВОДОПЛАВАЮЧІ ПТАХИ – птахи, екологічно пов'язані з водно-болотними угіддями, що мають міжнародне значення (Конвенція про водно-болотні угіддя).

WATER BIRDS – birds ecologically associated with wetlands of international importance (Convention on Wetlands).

ВПЛИВ НА ДОВКІЛЛЯ (далі – вплив) – будь-які наслідки планованої діяльності для довкілля, в тому числі наслідки для безпечності життєдіяльності людей та їхнього здоров'я, флори, фауни, біорізноманіття, ґрунту, повітря, води, клімату, ландшафту, природних територій та об'єктів, історичних пам'яток та інших матеріальних об'єктів чи для сукупності цих факторів, а також наслідки для об'єктів культурної спадщини чи соціально-економічних умов, які є результатом зміни цих факторів.

IMPACT ON THE ENVIRONMENT (hereinafter – impact) – any consequences of the planned activity for the environment, including consequences for the safety of people's activities and their health, flora, fauna, biodiversity, soil, air, water, climate, landscape, natural territories and objects, historical monuments and other material objects or for a combination of these factors, as well as the consequences for objects of cultural heritage or socio-economic conditions that are the result of changes in these factors.

ВЧЕННЯ ПРО БІОСФЕРУ – фундаментальне наукове положення, сформульоване академіком В.І. Вернадським (1863–1945), що наголошує провідну планетарну геохімічну роль живих організмів у формуванні біосфери як продукту тривалого перетворення речовини та енергії під час геологічного розвитку Землі. У межах біосфери всюди зустрічаються або сама жива речовина, або сліди її діяльності: гази атмосфери, природні води, запаси

нафти, природного газу, вугілля, вапняку, глини, сланців, торфу тощо. До праць В.І. Вернадського провідна роль у геологічних явищах та еволюції верхніх шарів літосфери (земної кори) відводилася фізико-хімічним процесам вивітрювання. Вернадський показав першочергову перетворюючу роль живих організмів та обумовлених ними механізмів руйнування гірських порід, кругообігу речовин, зміни водної та атмосферної оболонок Землі.

THE SCIENCE OF THE BIOSPHERE – a fundamental scientific position formulated by Academician V.I. Vernadsky (1863–1945), which emphasizes the leading planetary geochemical role of living organisms in the formation of the biosphere as a product of the long-term transformation of matter and energy during the geological development of the Earth. Within the biosphere, either living matter itself or traces of its activity are found everywhere: atmospheric gases, natural waters, reserves of oil, natural gas, coal, limestone, clay, shale, peat, etc. To the works of V.I. Vernadskyi, the leading role in geological phenomena and the evolution of the upper layers of the lithosphere (earth's crust) was assigned to the physical and chemical processes of weathering. Vernadskyi showed the primary transformative role of living organisms and the mechanisms of rock destruction caused by them, the circulation of substances, and changes in the Earth's water and atmospheric shells.

ГЕНОФОНД або генетичний фонд [від грец. genos – рід, походження і лат. fondus – підстава] – спадкова інформація, представлена в генах будь-якої групи особин. Іноді під Г. розуміється вся сукупність видів живих організмів.

GENEFOUND or genetic fund [from Greek. genos – genus, origin and lat. fondus – foundation] – hereditary information presented in the genes of any group of individuals. Sometimes the entire set of species of living ores is understood under the name of G.

ГЕОБОТАНІКА – наука про закономірності зв'язку рослин і рослинних угруповань (фітоценозів) з умовами середовища. Термін отримав поширення в кінці минулого століття, в даний час використовується як синонім більш сучасного терміну «наука про рослинність». До складу Г. включають декілька дисциплін: **фітоценологія** – наука про природу фітоценозів, **ботанічна географія** – наука про закономірності розподілу на планеті видів і сукупностей видів визначених територій (флор), географія рослинності. Як розділи Г. існують вчення про життєві форми рослин і оцінка умов середовища за типом рослинності (так звана індикаційна геоботаніка).

GEOBOTANY – science of the regularities of the connection of plants and plant communities (phytocenoses) with environmental conditions. The term became

widespread at the end of the last century, and is currently used as a synonym for the more modern term "vegetation science". G. includes several disciplines: **phytocenology** – the science of the nature of phytocenoses, **botanical geography** – the science of the regularity of the distribution of species and collections of species of defined territories (flora) on the planet, geography of vegetation. As sections of G., there are teachings about life forms of plants and assessment of environmental conditions by type of vegetation (so-called indication geobotany).

ГЕОЕКОЛОГІЯ (геологічна екологія) – розділ географії, що вивчає геосистеми різних ієрархічних рангів – до біосфері включно; закони взаємодії літосфери і біосфери з урахуванням діяльності людини, в т.ч. роль геологічних процесів у функціонуванні екосистем. У широкому трактуванні Г. – **ландшафтна екологія** (географічна екологія).

GEOECOLOGY (geological ecology) – a branch of geography that studies geosystems of various hierarchical ranks – up to and including the biosphere; laws of interaction of the lithosphere and the biosphere taking into account human activity, including the role of geological processes in the functioning of ecosystems. In a broad interpretation, G. is **landscape ecology** (geographic ecology).

ГИРЛО РІЧКИ – місце впадіння ріки в море, озеро або іншу річку. Для річок України, в цілому, властиві прості, нерозгалужені на рукава або лиманні гирла (Дніпро, Дністер, Південний Буг).

MOUTH OF A RIVER – the place where a river flows into the sea, a lake, or another river. The rivers of Ukraine, in general, are characterized by simple, unbranched estuaries or estuaries (Dnipro, Dniester, Southern Buh).

ГІРСЬКІ ЕКОСИСТЕМИ – займають значні площі суходолу і слугують природними перешкодами при переміщенні великих повітряних мас і хмар, що несуть дощі.

Особливістю Г.е. є висока біологічна різноманітність за рахунок вертикальної поясності, відмінностей екологічних умов на схилах різних експозицій та їх крутизни, строкатості геологічних порід. У будь-якій Г.е. багатство флори і фауни в кілька разів вище, ніж на оточуючій рівнині. Крім того, у складі рослинного і тваринного населення гір багато видів-ендеміків, які мають малі ареали, зазвичай обмежуються однією гірською системою або її частиною.

Всі Г.е. характеризуються слабкою стійкістю до режиму господарського використання. У високогірному поясі їх вразливість до господарського впливу людини, включаючи і вплив рекреації, пов'язана з низькою біологічною

продукцією сформованих там спільнот. У середньогірському поясі вона пов'язана з небезпекою ерозії грунтів. Грунти можуть руйнуватися при оранці схилів, вирубці лісів та інтенсивному випасанні худоби. У результаті господарського використання знижується верхня і підвищується нижня межа лісового поясу, а на південних схилах ліс може повністю зникнути і замінитися трав'янистою рослинністю. Під впливом людини можливий розвиток селів і сходження снігових лавин.

Г.е. вимагають найщадного режиму використання або повного заповідання. Велика частина гірських систем США, Швейцарії, ФРГ, Австрії, Італії та Іспанії перетворена в національні парки і заповідники. Необхідний суворий екологічний контроль у зонах їх рекреаційного використання, оскільки туризм (і навіть гірськолижний спорт у зимові місяці) може викликати незворотні зміни Г.е. – обереги клімату, прісної води і біологічного різноманіття.

MOUNTAIN ECOSYSTEMS – those that occupy large areas of land and serve as natural obstacles to the movement of large air masses and rain-bearing clouds.

A feature of M.e. there is a high biological diversity due to the vertical belt, differences in ecological conditions on the slopes of various exposures and their steepness, and a variety of geological rocks. In any M.e. the wealth of flora and fauna is several times higher than on the surrounding plain. In addition, the plant and animal population of the mountains includes many endemic species that have small areas, usually limited to one mountain system or part of it.

All M.e. are characterized by weak resistance to the regime of economic use. In the high mountain belt, their vulnerability to the economic influence of man, including the influence of recreation, is connected with the low biological production of the communities formed there. In the middle mountain belt, it is associated with the danger of soil erosion. Soils can be destroyed by plowing slopes, cutting down forests, and intensive livestock grazing. As a result of economic use, the upper and lower limits of the forest belt decrease, and on the southern slopes, the forest may completely disappear and be replaced by grassy vegetation. Under human influence, the development of villages and snow avalanches is possible.

M.e. require the most gentle mode of use or full bequest. Most of the mountain systems of the USA, Switzerland, Germany, Austria, Italy, and Spain have been turned into national parks and reserves. Strict environmental control is necessary for the areas of their recreational use since tourism (and even skiing in the winter months) can cause irreversible changes in the M.e. – protection of climate, freshwater, and biological diversity.

ГЛОБАЛЬНА ЕКОЛОГІЧНА КРИЗА – стан біосфери Землі, що загрожує порушенням самоорганізації екосистеми й руйнацією структурних і функціональних зв'язків, життєво важливих для існування її та суспільства. Характеризується не лише посиленням дії людини на природу, а й різким збільшенням впливу зміненої людьми природи на суспільний розвиток.

GLOBAL ENVIRONMENTAL CRISIS – a state of the Earth's biosphere that threatens to disrupt the ecosystem's self-organization and destroy the structural and functional connections that are vital for its existence and society. It is characterized not only by the strengthening of human action on nature but also by a sharp increase in the influence of human-altered nature on social development.

ГЛОБАЛЬНА ЕКОЛОГІЯ – розділ екології, що вивчає дію антропогенних чинників на біосферу в цілому і процеси, спричинені цією дією, розробляє прогнози наслідків таких процесів і визначає напрями діяльності, необхідної для відведення або ослаблення їхнього негативного впливу.

GLOBAL ECOLOGY – a section of ecology that studies the impact of anthropogenic factors on the biosphere as a whole and the processes caused by this action, develops forecasts of the consequences of such processes, and determines the directions of activity necessary to divert or weaken their negative impact.

ГЛОБАЛЬНИЙ ЕКОЛОГІЧНИЙ ФОНД – міжурядова структура, створена на експериментальних засадах для сприяння міжнародній співпраці та фінансування діяльності, спрямованої на усунення глобальних екологічних загроз.

GLOBAL ENVIRONMENTAL FUND – an intergovernmental structure created on an experimental basis to promote international cooperation and finance activities aimed at eliminating global environmental threats.

ГЛОБАЛЬНІ ЕКОЛОГІЧНІ ПРОБЛЕМИ – проблеми, пов'язані з порушенням рівноваги в підсистемах біосфери, що втрачають здатність до саморегуляції під впливом антропогенного чинника. Такі проблеми розглядають на національному, регіональному і глобальному рівнях. Вплив на довкілля, зумовлений специфікою ставлення до природи в окремій країні, здійснюється на конкретному національному рівні, поступово відбувається інтеграція негативних процесів на регіональному та глобальному рівнях. Причини виникнення проблем: швидке зростання масштабів виробництва, недосконаліть виробничих технологій, певний тип соціально-економічних відносин, криза духовної культури.

GLOBAL ENVIRONMENTAL PROBLEMS – problems associated with the disturbance of balance in subsystems of the biosphere, which lose their ability to self-regulate under the influence of anthropogenic factors. Such problems are considered at the national, regional, and global levels. The impact on the environment, caused by the specific attitude towards nature in a particular country, is carried out at a specific national level, and negative processes are gradually being integrated at the regional and global levels. The causes of problems: are rapid growth in the scale of production, imperfection of production technologies, a certain type of socio-economic relations, and crisis of spiritual culture.

ГЛОБАЛЬНІ ЗМІНИ КЛІМАТУ – сукупність процесів внутрішньовікових, міжвікових і тривалих періодів змін глобальної кліматичної системи Землі.

GLOBAL CLIMATE CHANGES – a set of intra-century, inter-century, and long-term changes in the Earth's global climate system.

ГОМЕОСТАЗ ПОПУЛЯЦІЙ (від грецьк. незмінний і положення та лат. населення) – здатність популяції підтримувати головні параметри структури (чисельність, народжуваність, смертність, щільність тощо) на певному, оптимальному для даного середовища існування рівні та динамічну рівновагу свого генетичного складу (генетичний гомеостаз).

HOMEOSTASIS OF POPULATIONS (from the Gr. immutable and position and Lat. population) – the ability of a population to maintain the main parameters of the structure (number, birth rate, mortality, density, etc.) at a certain, optimal level for a given habitat and the dynamic balance of its genetic composition (genetic homeostasis).

ГРІНПІС («Зелений мир») – одна з міжнародних природозахисних організацій.

GREENPEACE («Green Peace») – one of the international environmental organizations.

ҐРУНТИ ІСТОРИКО-КУЛЬТУРНОГО ПРИЗНАЧЕННЯ – території, на яких (і в яких) розташовуються пам'ятники історії та культури, визначні місця, в тому числі оголошені заповідними, національними парками, історико-культурними заповідниками (музеями-заповідниками), а також зайняті установами культури і з якими пов'язане існування традиційних народних художніх промислів, ремесел та іншого прикладного мистецтва (Земельний кодекс України).

GROUNDS OF HISTORICAL AND CULTURAL PURPOSE – territories on which (and in which) historical and cultural monuments are located, places of interest, including those declared protected, national parks, historical and cultural reserves (reserve museums), as well as occupied by cultural institutions and with which the existence of traditional folk crafts, handicrafts, and other applied arts is connected (Land Code of Ukraine).

ҐРУНТИ ПРИРОДНО-ЗАПОВІДНОГО ПРИЗНАЧЕННЯ – землі заповідників, пам'яток природи, природних (національних) і дендрологічних парків, ботанічних садів (Земельний кодекс України).

LANDS OF NATURE RESERVE PURPOSE – lands of nature reserves, natural monuments, natural (national) and dendrological parks, and botanical gardens (Land Code of Ukraine).

ҐРУНТИ ПРИРОДООХОРОННОГО ПРИЗНАЧЕННЯ – землі заповідників (за винятком мисливських), заборонних і нерестоохоронних смуг; землі, зайняті лісами, які виконують захисні функції; інші землі в системі охоронних природних територій; землі пам'ятників природи (Земельний кодекс України).

LANDS FOR NATURE PROTECTION PURPOSE – lands of nature reserves (except for hunting), prohibition and spawning protection zones; lands occupied by forests that perform protective functions; other lands in the system of protected natural territories; lands of natural monuments (Land Code of Ukraine).

ҐРУНТИ РЕКРЕАЦІЙНОГО ПРИЗНАЧЕННЯ – ділянки, призначені та використовуються для організованого масового відпочинку і туризму населення (Земельний кодекс України).

RECREATIONAL SOILS – areas designated and used for organized mass recreation and tourism of the population (Land Code of Ukraine).

ДЕРЖАВНА ЛІСОВА ОХОРОНА – правоохоронний орган, метою діяльності якого є здійснення правових, лісоохоронних та інших заходів, спрямованих на збереження, розширене відтворення, невиснажливе використання лісових ресурсів та об'єктів тваринного світу, та виконнаню основних завдань, зокрема, забезпечення охорони лісів від пожеж, незаконних рубок, шкідників і хвороб, пошкодження внаслідок антропогенного та іншого шкідливого впливу.

STATE FOREST PROTECTION – a law enforcement body whose purpose is to implement legal, forest protection and other measures aimed at the preservation,

expanded reproduction, tireless use of forest resources and objects of the animal world, and the performance of the main tasks, in particular, ensuring the protection of forests from fires, illegal felling, pests and diseases, damage due to anthropogenic and other harmful effects.

ДЕРЖАВНА СИСТЕМА МОНІТОРИНГУ ДОВКІЛЛЯ – це система спостережень, збирання, оброблення, передавання, збереження та аналізу інформації про стан довкілля, прогнозування його змін і розроблення науково обґрунтованих рекомендацій для прийняття рішень про запобігання негативним змінам стану довкілля та дотримання вимог екологічної безпеки.

THE STATE SYSTEM OF ENVIRONMENTAL MONITORING – a system of observation, collection, processing, transmission, storage, and analysis of information about the state of the environment, forecasting its changes and developing scientifically based recommendations for making decisions on preventing negative changes in the state of the environment and complying with environmental safety requirements.

ДЕНДРОПАРК (від грецьк. дерево та англ. парк) – парк ландшафтного типу, створений на основі природних ділянок лісу і штучного дендрарію. Зазвичай має у своєму складі систему штучних мальовничих водойм, печер, гротів, споруд садово-паркової архітектури (павільйони, альтанки) тощо. В Україні відомі Д. “Олександрія” в Білій Церкві, “Софіївка” в Умані, “Тростянець” у Чернігівській області тощо.

DENDROPARK (from the Gr. tree and the Engl. park) – a landscape-type park created based on natural areas of the forest and an artificial arboretum. It usually includes a system of artificial picturesque water bodies, caves, grottoes, structures of garden and park architecture (pavilions, gazebos), etc. In Ukraine, well-known D. "Olexandria" in Bila Tserkva, "Sophiivka" in Uman, "Trostianets" in Chernihiv region, etc.

ДЕРЖАВНИЙ КАДАСТР ОБ'ЄКТІВ ТВАРИННОГО СВІТУ – сукупність відомостей про географічне поширення об'єктів тваринного світу, їх чисельність, характеристики середовища проживання, інформація про їх господарське використання.

STATE CADASTRES OF ANIMAL OBJECTS – a set of information on the geographical distribution of animal objects, their number, habitat characteristics, and information on their economic use.

ДЕРЖАВНИЙ КАДАСТР ОСОБЛИВИХ ОХОРОННИХ

ПРИРОДНИХ ТЕРИТОРІЙ – документ, що включає відомості про статус цих територій, їх географічне положення і межі, про режим особливої охорони територій, перелік природокористувачів; еколого-просвітницьку, наукову, економічну, історичну та культурну цінність.

STATE CADASTER OF SPECIAL PROTECTIVE NATURAL TERRITORIES – a document that includes information on the status of these territories, their geographical location and boundaries, the regime of special protection of territories, a list of nature users; environmental, educational, scientific, economic, historical and cultural value.

ДЕРЖАВНИЙ КОНТРОЛЬ ЗА ВИКОРИСТАННЯМ ЗЕМЕЛЬ – контроль за дотриманням міністерствами, відомствами, державними, кооперативними, громадськими підприємствами, організаціями та установами, а також громадянами земельного законодавства, порядку користування землею, правильності ведення земельного кадастру та землеустрою з метою раціонального ефективного використання та охорони земель.

STATE CONTROL OF LAND USE – control over compliance by ministries, departments, state, cooperative, public enterprises, organizations, and institutions, as well as citizens of land legislation, the procedure for land use, the correctness of land cadastre and land management for rational, effective use and protection of land.

ДЕРЖАВНИЙ ЛІСОВИЙ КАДАСТР – документ, який містить відомості про екологічні, економічні та інші кількісні і якісні характеристики лісового фонду.

STATE FOREST CADASTRE – a document that contains information on ecological, economic, and other quantitative and qualitative characteristics of the forest fund.

ДЕРЖАВНІ ПРИРОДНІ БІОСФЕРНІ ЗАПОВІДНИКИ – державні природні заповідники (див. нижче), які входять до міжнародної системи біосферних резерватів, що здійснюють глобальний екологічний моніторинг.

STATE NATURAL BIOSPHERE RESERVES – state nature reserves (see below) that are part of the international system of biosphere reserves that carry out global environmental monitoring.

ДЕРЖАВНІ ПРИРОДНІ ЗАКАЗНИКИ – території (акваторії), що мають особливе значення для збереження чи відновлення природних комплексів або їх компонентів та підтримки екологічного балансу.

STATE NATURAL RESERVES – territories (water areas) that are of particular importance for the preservation or restoration of natural complexes or their components and maintaining the ecological balance.

ДЕРЖАВНІ ПРИРОДНІ ЗАПОВІДНИКИ – природоохоронні, науково- дослідні та еколого-просвітницькі установи, метою яких є збереження і вивчення природного ходу природних процесів і явищ, генетичного фонду рослинного і тваринного світу, окремих видів і спільнот рослин і тварин, типових та унікальних екологічних систем.

STATE NATURE CONSERVATION AREA – nature conservation, scientific research, and ecological educational institutions, the purpose of which is to preserve and study the natural course of natural processes and phenomena, the genetic fund of the plant and animal world, individual species and communities of plants and animals, typical and unique ecological systems.

ДЖЕРЕЛО – природний вихід підземних вод на поверхню. Утворюється зазвичай у понижених формах рельєфу, де земна поверхня перетинається з водоносними горизонтами. Джерела бувають холодними та гарячими (терми). Джерела із постійним вмістом у воді значної кількості (від 1 до 50г/л) розчинених солей та газів називають *мінеральними*.

A **SOURCE** – a natural outlet of underground water to the surface. It is usually formed in low landforms where the earth's surface intersects with aquifers. The sources are cold and hot (terms). Springs with a constant content of a significant amount (from 1 to 50 g/l) of dissolved salts and gases in the water are called *mineral*.

ДЖЕРЕЛО ЗАБРУДНЕННЯ ПОВЕРХНЕВИХ ВОД – об'єкти природи, природні або штучні процеси та явища, що викликають забруднення поверхневих водойм. Основними Д.з.п.в. є неочищені або погано очищені стічні води, поверхнево-активні речовини, пестициди, що надходять у водойми з дощовими або талими водами.

SOURCE OF SURFACE WATER POLLUTION – objects of nature, natural or artificial processes, and phenomena that cause surface water pollution. The main S.s.w.p. there are untreated or poorly treated sewage, surface-active substances, and pesticides entering water bodies with rainwater or meltwater.

ДИКА ПРИРОДА – сукупність неодомашнених тварин, рослин, що не культивуються, а також ландшафт, якого не торкнулась діяльність людини.

WILD NATURE – a collection of non-domesticated animals, and non-cultivated plants, as well as a landscape that has not been touched by human activity.

ДИНАМІКА ЕКОСИСТЕМИ АНТРОПОГЕННА – зміна угруповань (сукцесія), спричинена діяльністю людини. Як правило, це відносно зворотні зміни катастрофічного характеру (наприклад, вирубування лісів).

ANTHROPOGENIC ECOSYSTEM DYNAMICS – changes in groups (succession) caused by human activity. As a rule, these are relatively reversible changes of a catastrophic nature (for example, deforestation).

ДОЗВІЛ НА ДОБУВАННЯ ТВАРИН – документ (ліцензія, відстрільна картка, дозвіл на селекційний, діагностичний та науковий відстріл), який дає право на добування (в тому числі відлов) дикої тварини (тварин), а також право на використання (транспортування, перенесення, зберігання) продукції полювання.

PERMIT FOR HUNTING ANIMALS – a document (license, shooting card, permit for selective, diagnostic, and scientific shooting) that gives the right to hunt (including catching) a wild animal (animals), as well as the right to use (transportation, transfer, storage) hunting products.

ЕКОЛОГІЧНА ЕКСПЕРТИЗА – система державних природоохоронних заходів, спрямованих на перевірку відповідності проектів і планів у галузі будівництва та використання природних ресурсів вимогам екологічного захисту природного середовища. Е.е. – це оцінка впливу комплексу господарських нововведень на середовище життя, природні ресурси і здоров'я людей. Базується на екологічних нормативах. Виражається як в економічних, так і в неекономічних показниках. Існують різні форми Е.е., які стосуються різних об'єктів експертизи: раціональне природокористування у проектах перспективних та річних планів економічного та соціального розвитку; територіальні комплексні схеми охорони природи; проекти будівництва підприємств та споруд; проекти планування та забудови міст та населених пунктів; проекти перетворення природного середовища; проекти стандартів та технічних умов на нові види сировини, виробів, матеріалів.

ENVIRONMENTAL EXPERTISE – a system of state environmental protection measures aimed at checking the compliance of projects and plans in the field of construction and use of natural resources with the requirements of ecological protection of the natural environment. E.e. is an assessment of the impact of a complex of economic innovations on the living environment, natural resources, and people's health. It is based on environmental standards. It is expressed both in economic and non-economic indicators. There are different forms of E.e., which relate to different objects of expertise: rational nature management in projects of

long-term and annual plans of economic and social development; territorial complex nature protection schemes; construction projects of enterprises and structures; projects of planning and development of cities and settlements; natural environment transformation projects; projects of standards and technical conditions for new types of raw materials, products, materials.

ЕКОЛОГІЧНА МЕРЕЖА – мережа з'єднаних між собою ділянок природних територій. Е.м. включає **“екологічні ядра”** – значні за розмірами території, як правило, заповідні, **“екологічні коридори**” – ділянки, що поєднують між собою ядра, **буферні зони** – території, які слугують захисту, пом'якшенню зовнішніх впливів на екоядра та екокоридори. Метою створення Е.м. є забезпечення ценотичної та екосистемної цілісності, біомної репрезентативності природного середовища.

ECOLOGICAL NETWORK – a network of interconnected areas of natural territories. E.n. includes "**ecological cores**" – large territories, usually protected areas, "**ecological corridors**" – areas connecting cores, **buffer zones** – territories that serve to protect and mitigate external influences on ecocores and ecocorridors. The purpose of creating E.n. is to ensure cenotic and ecosystem integrity, and biome representativeness of the natural environment.

ЕКОЛОГІЧНА МЕРЕЖА – сукупність взаємопов’язаних природних об’єктів, переважно тих, що охороняються, які у межах фізико-географічного чи адміністративнотериторіального простору доповнюють один одного і забезпечують екологічну стабільність. До складу мережі входять райони (ядра, біоцентри), що різняться значенням, функціями і концентрацією біорізноманіття, буферні зони, відновлювані зони, в яких природний рослинний покрив відновлюється до оптимального, а також екологічні коридори.

ECOLOGICAL NETWORK – a set of interconnected natural objects, mainly those that are protected, which complement each other within the limits of physical-geographical or administrative-territorial space and ensure ecological stability. The network includes areas (cores, biocenters) that differ in value, functions, and concentration of biodiversity, buffer zones, regenerating zones in which the natural vegetation cover is restored to its optimum, as well as ecological corridors.

ЕКОНОМІЧНІ ЗАХОДИ ЗАБЕЗПЕЧЕННЯ ОХОРОНИ НАВКОЛИШНЬОГО ПРИРОДНОГО СЕРЕДОВИЩА – відшкодування в установленому порядку збитків, завданих порушенням законодавства про охорону навколишнього природного середовища.

ECONOMIC MEASURES TO ENSURE THE PROTECTION OF THE ENVIRONMENT – compensation following the established procedure for damages caused by violations of the legislation on environmental protection.

ЕКОЛОГІЧНА ЯКІСТЬ НАВКОЛИШНЬОГО ПРИРОДНОГО СЕРЕДОВИЩА – здатність забезпечувати функціонування екологічних систем, комфортність життєдіяльності людини та збереження фізико–географічної основи територіальних природно–ресурсних комплексів.

ENVIRONMENTAL QUALITY – the ability to ensure the functioning of ecological systems, the comfort of human life, and the preservation of the physical and geographical basis of territorial natural resource complexes.

ЕКОЛОГІЧНИЙ МОНІТОРИНГ – система спостережень, збору, передачі, обробки, зберігання та аналізу інформації про стан оточуючого природного середовища, прогнозування його змін та розробка науково обґрунтованих рекомендацій для прийняття відповідних рішень з охорони, раціонального використання природних ресурсів та попередження про критичні ситуації, небезпечні для здоров'я людини. Першочергова увага у Е.м. приділяється антропогенним змінам у природі.

ENVIRONMENTAL MONITORING – a system of observation, collection, transmission, processing, storage, and analysis of information about the state of the surrounding natural environment, forecasting its changes and development of scientifically based recommendations for making appropriate decisions on protection, rational use of natural resources and warning of critical situations dangerous to health I am a person. Priority attention in E.m. is devoted to anthropogenic changes in nature.

ЕКОСИСТЕМА (грецьк. oikos – житло, місце помешкання, systema – сполучення, об'єднання), або *екологічна система* – сукупність спільно проживаючих різних видів організмів та умов їхнього існування, що знаходяться у закономірному взаємозв'язку один з одним, утворюють взаємно обумовлені біотичні та абіотичні явища і процеси. Такий динамічний комплекс угруповань рослин, тварин та мікроорганізмів, а також факторів оточуючого середовища взаємодіє як єдине функціональне ціле. З точки зору трофічних відносин будь-яка Е. має два компоненти: автотрофний та гетеротрофний. Е. здатна до самопідтримки та саморегулювання.

Термін “екосистема” введений англійським ботаніком А. Тенслі (1871–1955); позначає відносно стійку систему динамічної рівноваги, в якій організми і неорганічні фактори середовища є повноправними компонентами.

Екосистемою є спільно функціонуючі на даній ділянці організми (біотична спільнота), які взаємодіють з фізичним середовищем таким чином, що потік енергії створює чітко визначені біотичні структури і кругообіг речовин між живою і неживою частинами. Надалі поняття трансформувалося багатьма авторами, і у функціональній частині близьке до поняття біогеоценозу. Е. – більш широке поняття, яке використовується стосовно природніх, різних за розмірами комплексів (океан, тундра, ліс, калюжа, крапля води) та штучних (акваріум, місто, територія ферми) угруповань. На відміну від екосистеми межі біогеоценозу визначаються сполученням рослинних спільнот однорідного видового складу та будови. Можна розглядати біогеоценоз як один із варіантів екосистеми. Однак суттєвих відмінностей між екосистемою та біогеоценозом немає.

Е. можуть бути різних порядків: від найдрібніших до дуже великих аж до біосфери. Е. – широке поняття, близьке до понять комплекс природний, геосистема, але більш біологічне за сутністю, оскільки центральною концепцією Е. є уявлення про ланцюги харчування і трофічні рівні. Пропонувалися інші терміни, адекватні за змістом Е.: мікрокосм (Форбс, 1887); голоцен (Фрідеріксен, 1931); біохор (Пальман, 1931); біосистеми (Тіннеман, 1941); екотон (Троль, 1950); сайт (Хілс , 1960), але вони не отримали поширення.

Розрізняють Е. за типом живлення – **автотрофні** (якщо головну роль у системі відіграють продуценти) та **гетеротрофні** (екосистеми льодовиків, океанічних глибин); за місцем знаходження – **наземні** та **водні**; за ступенем перетворення людиною – **природні** та **штучні** (аграрні, міські, промислові). Найважливішими природними екосистемами є: тайга, тундра, океани, болота, степи помірних широт, ліси помірних широт, вологі екваторіальні ліси, гори, острови та інші.

Незалежно від ступеню складності Е. характеризується: видовим складом, чисельністю видів, популяцій видів, чисельністю організмів у складі популяцій, біомасою, співвідношенням окремих трофічних груп, інтенсивністю процесів продукування та деструкції органічної речовини. Виділяють два підходи до вивчення Е.: аналітичний – досліджують окремі частини системи; синтетичний – вивчають всю систему в цілому.

ECOSYSTEM (Greek oikos – dwelling, place of residence, systema – connection, association), or *ecological system* – a set of different types of organisms living together and the conditions of their existence, which are in a natural relationship with each other, form mutually conditioned biotic and abiotic phenomena and processes. Such a dynamic complex of groups of plants, animals, and microorganisms, as well as environmental factors, interacts as a single

functional whole. From the point of view of trophic relations, any E. has two components: autotrophic and heterotrophic. E. is capable of self-support and self-regulation.

The term "ecosystem" was introduced by the English botanist A. Tansley (1871–1955); denotes a relatively stable system of dynamic equilibrium in which organisms and inorganic factors of the environment are full-fledged components. An ecosystem is the organisms (biotic community) functioning together in a given area, which interact with the physical environment in such a way that the flow of energy creates clearly defined biotic structures and the circulation of substances between living and non-living parts. Later, the concept was transformed by many authors, and in the functional part, it is close to the concept of biogeocenosis. E. is a broader concept that is used about natural complexes of different sizes (ocean, tundra, forest, puddle, drop of water) and artificial (aquarium, city, farm territory) groups. In contrast to the ecosystem, the boundaries of the biogeocenosis are determined by the combination of plant communities of homogeneous species composition and structure. Biogeocenosis can be considered as one of the variants of the ecosystem. However, there are no significant differences between ecosystems and biogeocenosis.

E. can be of different orders: from the smallest to very large up to the biosphere. E. is a broad concept, close to the concepts of natural complexity, and geosystem, but more biological, since the central concept of E. is the idea of food chains and trophic levels. Other terms adequate in terms of E.'s content were proposed: microcosm (Forbes, 1887); Holocene (Frederiksen, 1931); biochorus (Palman, 1931); biosystems (Tinneman, 1941); ecotone (Troll, 1950); site (Hills, 1960), but they did not spread.

E. are distinguished by the type of nutrition – **autotrophic** (if the main role in the system is played by producers) and **heterotrophic** (ecosystems of glaciers, deep oceans); by location – **land** and **water**; according to the degree of human transformation – **natural** and **artificial** (agrarian, urban, industrial). The most important natural ecosystems are taiga, tundra, oceans, swamps, steppes of temperate latitudes, forests of temperate latitudes, humid equatorial forests, mountains, islands, and others.

Regardless of the degree of complexity, E. is characterized by: species composition, number of species, populations of species, number of organisms in the composition of populations, biomass, ratio of individual trophic groups, intensity of processes of production, and destruction of organic matter. There are two approaches to the study of E.: analytical - examine individual parts of the system; synthetic – study the entire system as a whole.

ЕЛЕМЕНТИ ЛАНДШАФТУ [від лат. elementum – початковий, первинний] – найпростіші частини компонентів ландшафту, з комбінації яких складається різноманіття наземних об'єктів, або які визначають максимальну межу їх розчленування (окремий ґрунтовий горизонт, ярус рослинного покриву, запас води в ґрунтовому горизонті і т.д.).

ELEMENTS OF LANDSCAPE [from lat. elementum – initial, primary] – the simplest parts of landscape components, the combination of which consists of a variety of terrestrial objects, or which determine the maximum limit of their dismemberment (a separate soil horizon, a layer of plant cover, water reserves in the soil horizon, etc.).

ЄВРОПЕЙСЬКИЙ ЧЕРВОНИЙ СПИСОК ТВАРИН ТА РОСЛИН, що перебувають під загрозою зникнення та рекомендація щодо його застосування – документ схвалений Європейською економічною комісією на 46-й сесії (1991). Містить перелік таксонів фауни і флори, яким загрожує зникнення у світовому масштабі. Входять – 60 видів ссавців, 28 – птахів, 37 – рептилій, 19 – амфібій, 38 – прісноводних риб, 238 – безхребетних і близько 4500 судинних рослин.

EUROPEAN RED LIST OF ENDANGERED ANIMALS AND PLANTS and recommendation for its application – a document approved by the European Economic Commission at its 46th session (1991). Contains a list of fauna and flora taxa that are threatened with extinction on a global scale. They include – 60 species of mammals, 28 – species of birds, 37 – species of reptiles, 19 – species of amphibians, 38 – species of freshwater fish, 238 – species of invertebrates, and about 4,500 vascular plants.

ЗАГРОЗА БІОРІЗНОМАНІТТЮ – природні чи антропогенні чинники, що можуть призвести або вже призводять до збіднення чи знищення різноманітності проявів життя на внутрішньовидовому, видовому чи екосистемному рівнях. Йдеться насамперед про зростання ризику вимирання рідкісних видів організмів внаслідок діяльності людини, яка завдає шкоди природі.

THREAT TO BIODIVERSITY – natural or anthropogenic factors that can lead or are already leading to the impoverishment or destruction of the diversity of manifestations of life at the intraspecies, species, or ecosystem levels. It is primarily about the increasing risk of extinction of rare species of organisms as a result of human activities that harm nature.

ЗАПОВІДНА СПРАВА – теорія й практика організації та збереження

заповідних територій різних рангів. На заповідних територіях охороняються як окремі носії біорізноманіття – види, популяції, екосистеми, так і середовище в цілому. Ранг заповідної території визначається науковою значущістю об'єктів, що охороняються, та її площею. Серед заповідних територій найвищий ранг мають заповідники й національні парки, потім заказники й заповідно-мисливські господарства, а також пам'ятки природи.

CONSERVATION BIOLOGY – theory and practice of organizing and preserving protected areas of various ranks. Protected areas protect both the individual carriers of biodiversity – species, populations, ecosystems, and the environment as a whole. The rank of the protected area is determined by the scientific significance of the protected objects and their area. Reserves and national parks have the highest rank among protected areas, followed by sanctuaries and protected hunting farms, as well as natural monuments.

ЗАПОВІДНИК – вища категорія охоронних природних територій; виділена державою територія або акваторія, які представляють собою незмінений або слабко змінений людиною природний комплекс, що назавжди виключається з господарського використання (в тому числі відвідування людьми) заради збереження в незайманому вигляді еталонів природи, охорони представників тваринного, рослинного світу, ландшафтів і вивчення природних об'єктів, що мають особливу екологічну, генетичну, наукову або культурну цінність: типові та рідкісні ландшафти, еталонні ділянки природного середовища, рідкісні геологічні утворення, угруповання рослин і тварин із характерним генофондом тощо. Будь-яка діяльність, що порушує природні комплекси або загрожує стану природних об'єктів, заборонена як на території заповідника, так і в межах встановлених навколо них охоронних зон. На території З. категорично забороняються всі види господарської діяльності (мисливство, рибальство, вилов тварин, усі види лісокористування, заготівля сіна, лікарських трав, збирання квітів, випасання худоби), застосування будь-яких хімічних засобів, шумових дій. Розрізняють З. **біосферні** (Карпатський, Чорноморський, Асканія-Нова) та **природні** (“Медобори”, “Горгани”, “Мис Мартьян” та ін.).

RESERVE or **CONSERVATION AREA** – the highest category of protected natural territories; a territory or water area allocated by the state, which is an unchanged or slightly altered natural complex by man, which is permanently excluded from economic use (including visits by people) for the sake of preserving the standards of nature in a pristine form, protecting representatives of the animal and plant world, landscapes and studying natural objects that have a special ecological, genetic, scientific or cultural value: typical and rare landscapes, reference

areas of the natural environment, rare geological formations, groups of plants and animals with a characteristic gene pool, etc. Any activity that violates natural complexes or threatens the state of natural objects is prohibited both on the territory of the reserve and within the protection zones established around them. All types of economic activity (hunting, fishing, catching animals, all types of forest use, gathering hay, medicinal herbs, picking flowers, grazing cattle), the use of any chemical means, and noise activities are strictly prohibited on the territory of R. (C.a.) there are **biospheric** (Carpathian, Black Sea, Askania-Nova) and **natural** (Medobory, Gorgany, Cape Martyan, etc.) regions.

ЗАПОВІДНО-МИСЛИВСЬКЕ ГОСПОДАРСТВО – ділянка території, виділена для інтенсивного відтворення дичини і проведення суворо регульованих полювань. На його території також є невелике лісове господарство і проводяться наукові дослідження.

RESERVED HUNTING FARM – a section of the territory set aside for intensive game reproduction and strictly regulated hunting. There is also a small forestry on its territory and scientific research is carried out.

ЗАХИСНІ ЛІСОВІ НАСАДЖЕННЯ – штучно створені ліси, лісові смуги для захисту полів, ґрунтів, доріг, населених пунктів від посухи, суховіїв, ерозії; водойм – від забруднення стічними водами з полів, тваринницьких комплексів, а також для покращення кліматичних та гідрологічних умов місцевості.

PROTECTIVE FOREST PLANTATIONS – artificially created forests, forest strips to protect fields, soils, roads, and settlements from drought, drought, erosion; reservoirs – from pollution by wastewater from fields, and livestock complexes, as well as to improve the climatic and hydrological conditions of the area.

ЗАХИСТ СЕРЕДОВИЩА – комплекс міжнародних, державних, регіональних і локальних адміністративних, правових, технологічних, планових, соціально-економічних, політичних і суспільних заходів, спрямованих на охорону природного середовища.

ENVIRONMENTAL PROTECTION – a complex of international, state, regional, and local administrative, legal, technological, planning, socio-economic, political, and social measures aimed at protecting the natural environment.

ЗДАТНІСТЬ ДО САМООЧИЩЕННЯ – властивість розкладати забруднювачі до речовин, які засвоюються живими організмами і залучаються

в біотичний кругообіг. Базується на поглинанні та розкладанні забруднювачів переважно мікроорганізмами-редуцентами, залежить від їх кількості та фізіологічної активності. Іноді забруднювачі спочатку адсорбуються неорганічними речовинами, а потім розкладаються організмами. У багатьох регіонах України інтенсивність забруднення ґрунтів перевищує їхню З.с. Антропогенне навантаження на ріки нині перевищує їхню здатність до самоочищення.

SELF-CLEANING CAPACITY – the ability to break down pollutants into substances that are assimilated by living organisms and are involved in the biotic cycle. It is based on absorption and decomposition of pollutants mainly by reducing microorganisms, depending on their number and physiological activity. Sometimes pollutants are first adsorbed by inorganic substances and then decomposed by organisms. In many regions of Ukraine, the intensity of soil pollution exceeds their S.c. The anthropogenic load on rivers now exceeds their capacity for self-purification.

ЗДОРОВ'Я – об'єктивний стан і суб'єктивне відчуття повного фізичного, психічного та соціального комфорту; один із показників успішності збереження оточуючого людину середовища (природного та соціального). Рівень захворюваності та середня очікувана тривалість життя – основні критерії успішності соціально-економічного розвитку будь-якої країни. Здоров'я людини на 50% залежить від способу життя, на 20% – впливу спадкових чинників, на 20% – від екологічного стану довкілля, на 10% – від рівня медичного обслуговування.

В історичному аспекті до 30-х років минулого століття в економічно розвинених країнах світу стан здоров'я населення визначався переважно за рахунок більш повного забезпечення фізіологічних потреб людини (кількість та якість продуктів харчування), з 30-х по 60-ті роки – підвищення якості медичного обслуговування, з 70-х – збереження екологічного стану довкілля.

Здоров'я людини забезпечується сукупністю природних і соціальних умов, які разом визначають **якість життя** – ступінь відповідності середовища життя людини її потребам. Співвідношення між потребами людини (у природних, матеріальних, духовних, соціальних благах) та ступенем їх забезпеченості – **рівень життя населення**. Інтегральним показником якості та рівня життя населення є тривалість життя, особливо рівень захворюваності і смертності дітей (рівень смертності дітей до 1 року вважається індикатором екологічного стану довкілля).

В Україні рівень смертності перевищує рівень народжуваності: в 1991 році – на 39 тисяч чоловік, у 1994 році – на 243 тисячі, у 1995 році – на 276

тисяч, у 2000 році – на 268 тисяч, у 2010 році – на 178 тисяч. Середня тривалість життя – 66 років. Близько 30% українських дітей народжується з патологією, у структурі захворюваності дітей збільшується частка спадкової і вродженої патології. В Україні 60% населення страждають на алергічні захворювання. У структурі смертності перше місце посідають хвороби системи кровообігу, друге – злоякісні новоутворення, третє – хвороби органів дихання. До моменту закінчення школи 45% учнів мають різні хронічні захворювання, 30% – морфо-фізіологічні відхилення.

HEALTH – an objective state and subjective feeling of full physical, mental, and social comfort; one of the indicators of the success of preserving the environment (natural and social) surrounding a person. The incidence rate and average life expectancy are the main criteria for the success of the socio-economic development of any country. Human health depends 50% on lifestyle, 20% on the influence of hereditary factors, 20% on the ecological state of the environment, and 10% on the level of medical care.

Historically, until the 1930s of the last century in economically developed countries of the world, the state of health of the population was determined mainly due to a more complete provision of human physiological needs (quantity and quality of food), from the 1930s to the 1960s – an increase in quality medical care, since the 70s – preservation of the ecological state of the environment.

Human health is ensured by a set of natural and social conditions, which together determine the **quality of life** – the degree of conformity of a person's living environment to his needs. The ratio between human needs (natural, material, spiritual, and social goods) and the degree of their provision is the standard of living of the population. An integral indicator of the quality and **standard of living of the population** is life expectancy, especially the level of morbidity and mortality of children (the mortality rate of children under 1 year of age is considered an indicator of the ecological state of the environment).

In Ukraine, the death rate exceeds the birth rate: in 1991 – 39 thousand people, in 1994 – 243 thousand, in 1995 – 276 thousand, in 2000 – 268 thousand, and 2010 – 178 thousand. The average life expectancy is 66 years. About 30% of Ukrainian children are born with pathology, and the share of hereditary and congenital pathology is increasing in the structure of children's morbidity. In Ukraine, 60% of the population suffers from allergic diseases. In the structure of mortality, the first place is occupied by diseases of the circulatory system, the second – by malignant neoplasms, and the third – by diseases of the respiratory organs. By the time they finish school, 45% of students have various chronic diseases, and 30% have morphological and physiological abnormalities.

ЗЕЛЕНА ЗОНА – територія за межами міста, зайнята лісами, лісопарками та іншими озелененими територіями, яка виконує захисні, санітарно-гігієнічні та рекреаційні функції. Відпочиваючи у зеленій зоні, людина відновлює свою працездатність і добре самопочуття на 60% швидше, ніж під час відпочинку у межах міста.

GREEN ZONE – the territory outside the city limits, occupied by forests, forest parks, and other green areas, which performs protective, sanitary hygienic, and recreational functions. Resting in a green area, a person recovers his working capacity and well-being 60% faster than during rest in the city.

ЗЕЛЕНА КНИГА – форма науково-обґрунтованої охорони рослинних угруповань. Українські ботаніки запропонували охороняти не лише окремі види, а й цілі ценози, та встановили критерії виділення угруповань, які потребують охорони. У Зелену Книгу України зібрані відомості про рідкі та типові для певної місцевості рослинні спільноти, що потребують особливого режиму їх використання.

THE GREEN BOOK – a form of science-based protection of plant communities. Ukrainian botanists proposed to protect not only individual species, but also entire cenoses, and established criteria for identifying groups that need protection. The Green Book of Ukraine contains information on rare and typical plant communities for a certain area, which requires a special regime for their use.

ЗЕЛЕНІ НАСАДЖЕННЯ – сукупність деревних, чагарникових і трав'янистих рослин на певній території.

GREEN PLANTATIONS – a set of woody, shrubby, and herbaceous plants on a certain territory.

ЗЕМЛІ ПРИРОДНО-ЗАПОВІДНОГО ФОНДУ – це ділянки суші і водного простору з природними комплексами та об’єктами, що мають особливу природоохоронну, екологічну, наукову, естетичну, рекреаційну та іншу цінність, яким відповідно до закону надано статус територій та об’єктів природно-заповідного фонду.

LANDS OF THE NATURE-RESERVE FUND – areas of land and water space with natural complexes and objects that have special nature protection, ecological, scientific, aesthetic, recreational, and other value, which, by the law, have been granted the status of territories and objects of the nature reserve fund.

ЗООЛОГІЧНІ ПАРКИ – природоохоронні культурно-освітні установи, метою організації яких є створення експозицій рідкісних, екзотичних та

місцевих видів тварин, збереження їх генофонду, вивчення дикої фауни і розробки наукових основ її розведення у неволі, проведення екологічної освітньо-виховної роботи серед населення.

ZOOLOGICAL PARKS – nature conservation cultural and educational institutions, the purpose of which is to create exhibitions of rare, exotic, and local species of animals, preserve their gene pool, study wild fauna and develop the scientific basis of its breeding in captivity, carry out environmental educational work among the population.

ІНВЕНТАРИЗАЦІЯ ПРИРОДНИХ РЕСУРСІВ – систематизований облік кількості, якості, динаміки запасів та інших характеристик усіх природних ресурсів певної території, а також відомостей про обсяг, характер, форми і ступінь їх використання; складова державних кадастрів природних ресурсів і державної системи моніторингу довкілля.

INVENTORY OF NATURAL RESOURCES – systematic accounting of the quantity, quality, dynamics of reserves and other characteristics of all natural resources of a certain territory, as well as information on the volume, nature, forms, and extent of their use; a component of state cadastres of natural resources and the state system of environmental monitoring.

КАДАСТР [фр. cadastre від гр. katastichon – лист, реєстр] – систематизоване зведення відомостей про якісні та кількісні характеристики об'єкта, яке складається періодично або шляхом безперервних спостережень (інколи з економічною оцінкою). К. може включати рекомендації щодо використання об'єктів або явищ, заходи щодо їх охорони. Розрізняють К. **земельний**, **водний**, **лісовий, детериораційний** (про погіршення середовища), **промисловий, рекреаційний.**

CADASTRE [fr. cadastre from gr. katastichon – list, register] – a systematized summary of information about the qualitative and quantitative characteristics of an object, which is compiled periodically or through continuous observations (sometimes with an economic evaluation). K. may include recommendations for the use of objects or phenomena and measures for their protection. There are **land**, **water**, **forest**, **deterioration** (deterioration of the environment), **industrial**, and **recreational** C.

КАТАСТРОФА ЕКОЛОГІЧНА [грецьк. katastrophe – поворот, переворот] – неврівноважене, нестаціонарне перетворення навколишнього середовища, наслідком якого є втрата стійкості (втрата рівноваги) в результаті зміни власних параметрів та/або швидкої зміни зовнішніх перемінних. К.е.

переводить навколишнє середовище в стан рівноваги з меншим (у порівнянні з вихідним рівнем складності) енергетичним та екологічним потенціалом. К.е. виникає нерідко на основі прямого або непрямого антропогенного впливу, а також несприятливого і небезпечного природного явища. Даний стан характеризується втратою контролю за перебігом екологічних подій.

ENVIRONMENTAL DISASTER [Gr. katastrophe – turn, upheaval] – an unbalanced, non-stationary transformation of the environment, the consequence of which is a loss of stability (loss of equilibrium) as a result of a change in its own parameters and/or a rapid change in external variables. E.d. brings the environment into a state of equilibrium with a lower (compared to the initial level of complexity) energy and ecological potential. E.d. often arises based on direct or indirect anthropogenic influence, as well as an unfavorable and dangerous natural phenomenon. This state is characterized by a loss of control throughout environmental events.

КВАЗІПРАЛІСИ – умовно пралісові екосистеми, в яких відбувся незначний тимчасовий антропогенний вплив, що не змінив природної структури лісостанів і при припиненні якого натуральний стан екосистем повністю відтворюється протягом короткого періоду.

QUASI-PRALISES – conditionally primeval forest ecosystems, in which there was a minor temporary anthropogenic impact that did not change the natural structure of forest stands and upon termination of which the natural state of the ecosystems is completely restored within a short period.

КОЛЕКТИВНЕ ПОЛЮВАННЯ – полювання, у якому приймають участь двоє та більше людей (враховуючи мисливців, нагоничів, розпорядників полювання тощо), які об’єдналися для добування мисливських тварин.

COLLECTIVE HUNTING – a hunt in which two or more people (including hunters, hunters, hunt managers, etc.) participate, who have joined together to hunt game animals.

КОРИСТУВАЧІ МИСЛИВСЬКИХ УГІДЬ – суб’єкти господарювання, які отримали мисливські угіддя у користування в порядку, визначеному цим Законом, та є первинними користувачами державного мисливського фонду, здійснюють ведення мисливського господарства та організацію полювання в межах наданих у користування мисливських угідь.

USERS OF HUNTING GROUNDS – business entities that have received hunting grounds for use following the procedure specified by this Law, and are the

primary users of the state hunting fund, conduct hunting, and organize hunting within the limits of the hunting grounds provided for use.

КРУГООБІГ РЕЧОВИН – безперервний циклічний процес переміщення речовини у формі хімічних елементів та їх сполук від продуцентів до редуцентів через консументи або без них та знову до продуцентів; багаторазова участь речовин у процесах, які відбуваються в атмосфері, гідросфері, літосфері. Всі речовини на планеті знаходяться у процесі кругообігу. Найбільш інтенсивному та швидкому кругообігу підлягають легко рухливі речовини – гази та природні води, що складають атмосферу і гідросферу планети. Значно триваліше відбувається кругообіг матеріалу літосфери. У цілому кожний кругообіг будь-якого хімічного елементу є частиною загального кругообігу речовин на Землі; всі вони тісно пов'язані між собою. Жива речовина біосфери у цьому кругообігу виконує величезну роботу з перерозподілу хімічних елементів, що безперервно циркулюють у біосфері, переходячи із зовнішнього середовища до організмів та знов у зовнішнє середовище.

Сонячна енергія зумовлює на Землі два кругообіги речовин: великий (геологічний або біосферний) К.р. і малий (біологічний). **Біологічний** К.р. – колова циркуляція речовин між ґрунтом, рослинами, тваринами, мікроорганізмами та атмосферою: виявляється в живленні, диханні, розмноженні, розкладі, складних взаємодіях речовин. Продуценти створюють органічні речовини і виділяють вуглекислий газ. Консументи поїдають органічні речовини. Редуценти переробляють рештки неживих організмів, перетворюючи їх на прості органічні чи неорганічні речовини. Дихаючи, майже всі організми споживають кисень, виділяють вуглекислий газ. Біологічний К.р. – основа існування біосфери; складається з низки циклів – цикл води, вуглецю, кисню, азоту, фосфору. Цикли мають атмосферну стадію.

CIRCULATION OF SUBSTANCES – a continuous cyclical process of movement of matter in the form of chemical elements and their compounds from producers to reducers through consumers or without them and back to producers; multiple participation of substances in the processes that take place in the atmosphere, hydrosphere, lithosphere. All substances on the planet are in the process of circulation. The most intensive and rapid circulation is easily mobile substances – gases and natural waters that make up the planet's atmosphere and hydrosphere. The circulation of the material in the lithosphere takes much longer. In general, each cycle of any chemical element is part of the general cycle of substances on Earth; they are all closely related. The living matter of the biosphere in this cycle performs a huge work of redistribution of chemical elements that continuously circulate in the

biosphere, passing from the external environment to organisms and back to the external environment.

Solar energy causes two circulations of substances on Earth: a large (geological or biospheric) C.s. and a small (biological). **Biological** C.s. – the circular circulation of substances between the soil, plants, animals, microorganisms, and the atmosphere: it is manifested in nutrition, respiration, reproduction, decomposition, and complex interactions of substances. Producers create organic matter and emit carbon dioxide. Consumers eat organic matter. Reductants process the remains of non-living organisms, turning them into simple organic or inorganic substances. When breathing, almost all organisms consume oxygen and emit carbon dioxide. Biological C.s. – the basis of the existence of the biosphere; consists of several cycles – the cycle of water, carbon, oxygen, nitrogen, and phosphorus. Cycles have an atmospheric stage.

ЛАНДШАФТ [від нім. Land – земля, schaft – суфікс, що виражає взаємозв'язок, взаємозалежність] – природний територіальний комплекс, який складається з взаємодіючих природних або природно–антропогенних компонентів, а також комплексів нижчого таксономічного рангу. Ландшафт характеризується єдністю геологічної платформи, клімату та історії розвитку. Термін запозичений з загальнолітературної мови, де він зв'язується, як правило, з візуальними враженнями від пейзажу, картини природи, місцевості (за В.І. Вернадським). У межах Л. всі основні компоненти: рельєф, клімат, вода, грунт, рослинність і тваринний світ знаходяться у складній взаємодії, утворюючи однорідну за умовами розвитку нерозривну систему. Ландшафти поділяються на **природні** та **антропогенні.**

LANDSCAPE [from Germ. Land – earth, schaft – a suffix expressing interconnection, interdependence] – a natural territorial complex consisting of interacting natural or natural-anthropogenic components, as well as complexes of a lower taxonomic rank. The landscape is characterized by the unity of the geological platform, climate, and development history. The term is borrowed from the general literary language, where it is associated, as a rule, with visual impressions of the landscape, the picture of nature, and the area (according to V.I. Vernadskyi). Within L., all the main components: relief, climate, water, soil, vegetation, and animal life are in a complex interaction, forming an inseparable system that is homogeneous under the conditions of development. Landscapes are divided into **natural** and **anthropogenic**.

ЛІМІТИ НА ПРИРОДОКОРИСТУВАННЯ – це система екологічних обмежень на територіях; представляють собою встановлені підприємствам –

природокористувачам на певний термін обсяги граничного використання (вилучення) природних ресурсів, викидів і скидів забруднюючих речовин у навколишнє природне середовище та розміщення відходів виробництва.

LIMITS ON NATURE USE a system of environmental restrictions on territories; represents the volumes of limited use (withdrawal) of natural resources, emissions and discharges of pollutants into the surrounding natural environment, and disposal of production waste set for enterprises – nature users for a certain period.

ЛІМІТ ВИКОРИСТАННЯ ДЕРЖАВНОГО МИСЛИВСЬКОГО ФОНДУ – максимальна кількість мисливських тварин певного виду, яку користувач мисливських угідь може добути самостійно чи дозволити добути іншим мисливцям у наданих йому у користування мисливських угіддях впродовж мисливського сезону.

LIMIT OF THE USE OF THE STATE HUNTING FUND – the maximum number of hunting animals of a certain species, which the user of the hunting grounds can harvest independently or allow other hunters to harvest in the hunting grounds provided for his use during the hunting season.

ЛІМІТУЮЧІ ЧИННИКИ (лімітуючі фактори) – чинники, які обмежують будь-який прояв життєдіяльності організмів при певних умовах навколишнього середовища.

LIMITING FACTORS – factors that limit any manifestation of vital activity of organisms under certain environmental conditions.

ЛІС – тип природних комплексів (екосистема), у якому поєднуються переважно деревна та чагарникова рослинність з відповідними ґрунтами, трав'яною рослинністю, тваринним світом, мікроорганізмами та іншими природними компонентами, що взаємопов'язані у своєму розвитку, впливають один на одного і на навколишнє природне середовище. Л. – тип природних комплексів (екосистема), у якому поєднуються переважно деревна та чагарникова рослинність з відповідними ґрунтами, трав'яною рослинністю, тваринним світом, мікроорганізмами та іншими природними компонентами, що взаємопов'язані у своєму розвитку, впливають один на одного і на навколишнє природне середовище.

FOREST – a type of natural complex (ecosystem) in which mainly woody and shrub vegetation is combined with appropriate soils, herbaceous vegetation, animal life, microorganisms, and other natural components that are interconnected in their development, and influence each other and the environment's natural environment.

F. – a type of natural complex (ecosystem), in which mainly tree and shrub vegetation is combined with appropriate soils, herbaceous vegetation, animal life, microorganisms, and other natural components that are interconnected in their development, and influence each other and the surrounding natural environment.

ЛІСОВА ДІЛЯНКА – ділянка лісового фонду України з визначеними межами, виділена відповідно до цього Кодексу для ведення лісового господарства та використання лісових ресурсів без вилучення її у землекористувача або власника землі.

FOREST PLOT – a plot of the forest fund of Ukraine with defined boundaries, allocated by this Code for forestry management and use of forest resources without seizing it from the land user or land owner.

ЛІСОКОРИСТУВАННЯ – регламентована сукупність форм і методів комплексного використання лісових багатств.

FOREST USE – a regulated set of forms and methods of comprehensive use of forest resources.

ЛІСИ РЕКРЕАЦІЙНО-ОЗДОРОВЧІ – природні або штучно створені ліси, що виконують переважно рекреаційні, санітарні, гігієнічні та оздоровчі функції. Використовують для різних видів відпочинку населення, туризму, заняття спортом і санаторно-курортного лікування. До них відносять: міські ліси, лісопарки, лісопаркові зелені зони.

RECREATIONAL AND HEALTH-IMPROVING FORESTS – natural or artificially created forests that mainly perform recreational, sanitary, hygienic, and health-improving functions. They are used for various types of public recreation, tourism, sports, and sanatorium-resort treatment. They include urban forests, forest parks, and forest park green zones.

ЛІСОВА ТИПОЛОГІЯ – вчення про взаємозв’язки із середовищем, в основі якого лежать дослідження лісових екосистем. Є теоретичною базою лісівництва.

FOREST TYPOLOGY – the science of relationships with the environment, which is based on the study of forest ecosystems. It is the theoretical base of forestry.

ЛІСОВІ УГРУПОВАННЯ – система автотрофних та гетеротрофних організмів, які взаємодіють в умовах лісового середовища та диференційовані за екологічними нішами лісової екосистеми. Функціонування залежить від взаємовідносин популяцій тварин, рослин і мікроорганізмів та місця їхнього

існування.

FOREST GROUPS – a system of autotrophic and heterotrophic organisms that interact in the forest environment and are differentiated by ecological niches of the forest ecosystem. Functioning depends on the interrelationship of animal, plant, and microorganism populations and their place of existence.

ЛІСОПАРК – природний впорядкований ліс, призначений для відпочинку населення і організований у конкретну ландшафтно-планувальну систему за допомогою постійної реконструкції насаджень. Залежно від видів рекреаційних впливів та наявності унікальних об’єктів виділяють лісопарки загального типу, або прогулянкові, поліфункціональні, спеціалізовані: історико-меморіальні, курортні, спортивні. Лісопарки поділяють на дві групи: в межах міської забудови та за містом на відстані до 200 м, вони забезпечують поліпшення стану міського середовища, підвищують його архітектурнохудожню функцію та органічно поєднують міський і природний ландшафт.

FOREST PARK – a natural orderly forest intended for public recreation and organized into a specific landscape-planning system with the help of permanent reconstruction of plantations. Depending on the types of recreational influences and the presence of unique objects, forest parks of the general type are distinguished, or walking, multifunctional, specialized: historical and memorial, resort, and sports. Forest parks are divided into two groups: within the urban development and outside the city at a distance of up to 200 m. They ensure the improvement of the urban environment, increase its architectural and artistic function and organically combine the urban and natural landscape.

ЛІСОРОСЛИННІ УМОВИ – комплекс абіотичних, біотичних і антропогенних чинників, які зумовлюють функціонування рослинних компонентів лісової екосистеми.

FOREST PLANT CONDITIONS – a complex of abiotic, biotic, and anthropogenic factors that condition the functioning of the plant components of the forest ecosystem.

МИСЛИВСТВО – вид спеціального використання тваринного світу, яке здійснюється шляхом добування диких звірів та птахів, що перебувають у стані природної волі або утримуються в напіввільних умовах у межах мисливських угідь і які можуть бути об'єктами полювання. М. – вид спеціального використання тваринного світу шляхом добування мисливських тварин, що перебувають у стані природної волі або утримуються в

напіввільних умовах у межах мисливських угідь. М. – мисливство – вид спеціального використання тваринного світу шляхом добування мисливських тварин, що перебувають у стані природної волі. Не є мисливством добування, знищення або поранення тварин, які утримуються в напіввільних умовах у межах мисливських угідь та перебувають у власності користувача мисливських угідь.

HUNTING – a type of special use of the animal world, which is carried out by harvesting wild animals and birds that are in a state of natural freedom or are kept in semi-free conditions within hunting grounds and that can be hunting objects. H. – a type of special use of the animal world by harvesting hunting animals that are in a state of natural freedom or kept in semi-free conditions within the boundaries of hunting grounds. H. – hunting – a type of special use of the animal world by obtaining hunting animals that are in a state of natural will. It is not hunting to obtain, destroy, or injure animals that are kept in semi-free conditions within the boundaries of the hunting grounds and are owned by the user of the hunting grounds.

МИСЛИВЕЦЬ – фізична особа, яка отримала в установленому порядку документи на право полювання.

HUNTER – a natural person who has received documents for the right to hunt in the prescribed manner.

МИСЛИВСЬКЕ ГОСПОДАРСТВО ЯК ГАЛУЗЬ – природо-ресурсна сфера суспільного виробництва, основними завданнями якого є регулювання чисельності диких тварин, охорона, відтворення та стале використання мисливських тварин, розвиток мисливського собаківництва, надання послуг мисливцям щодо здійснення полювання та суміжних екосистемних послуг громадянам.

HUNTING FARMS AS AN INDUSTRY – a natural-resource sphere of social production, the main tasks of which are the regulation of the number of wild animals, protection, reproduction and sustainable use of hunting animals, development of hunting dog breeding, provision of services to hunters for hunting and related ecosystem services to citizens.

МИСЛИВСЬКІ УГІДДЯ ДЕРЖАВНОГО МИСЛИВСЬКОГО РЕЗЕРВУ (або запасу) – мисливські угіддя, які не закріплені за певними користувачами або звільнилися за рахунок позбавлення права користування чи відмови користувача від користування. Охорона таких угідь та регулювання чисельності тварин в них здійснюються безпосередньо відповідним територіальним органом центрального органу виконавчої влади,

який забезпечує формування та реалізацію державної політики у сфері мисливського господарства.

HUNTING GROUNDS OF THE STATE HUNTING RESERVE – hunting grounds that are not assigned to certain users or became vacant due to the deprivation of the right to use or the user's refusal to use. The protection of such lands and the regulation of the number of animals in them are carried out directly by the relevant territorial body of the central executive body, which ensures the formation and implementation of state policy in the field of hunting.

МОНІТОРИНГ – система регулярних, тривалих спостережень за зміною екосистем і біосфери, а також спостереження за певними об'єктами чи явищами в просторі і в часі, що дає інформацію про стан навколишнього середовища з метою оцінки минулого, сьогодення і прогнозів на майбутнє, параметрів навколишнього середовища, які мають значення для людини (програма ЮНЕСКО, 1974 р.).

***Сучасне визначення моніторингу*:** М. – система контролю оточуючого середовища, яка включає три основних види діяльності:

1) **спостереження і контроль** – систематичні спостереження за станом оточуючого середовища;

2) **прогноз** – визначення можливих змін природи під впливом природних і антропогенних факторів;

3) **керування** – заходи щодо регулювання стану оточуючого середовища.

Основними функціями моніторингу є: контроль за якістю атмосферного повітря, води, ґрунту та інших компонентів біосфери, визначення основних джерел забруднення та ін. Моніторинг розрізняють *за масштабами узагальнення інформації*: **глобальний, національний, регіональний, локальний**; *за методами ведення*: **біологічний** (за допомогою біоіндикаторів), **дистанційний** (авіаційний, космічний); *за об'єктами спостереження*: **атмосферний, повітряний, водний, ґрунтовий, рослинності**, **тваринного світу, здоров'я населення**. Інформацію збирають гідрометеорологічні та санітарно-епідеміологічні станції, заповідники (у вигляді літопису природи), відомства (у вигляді кадастрів природних ресурсів) відповідно до заздалегідь встановленого графіка в певних пунктах і в певний період часу з використанням порівняльних методів вимірювання та збору даних.

MONITORING – a system of regular, long-term observations of changes in ecosystems and the biosphere, as well as observation of certain objects or phenomena in space and time, which provides information about the state of the

environment to assess the past, present, and future forecasts, environmental parameters, which are important for humans (UNESCO program, 1974).

The modern definition of monitoring: M. is a system of monitoring the surrounding environment, which includes three main types of activity:

1) **observation and control** – systematic observation of the state of the surrounding environment;
2) **forecast** – determination of possible changes in nature under the influence of natural and anthropogenic factors;
3) **management** – measures to regulate the state of the surrounding environment.

The main functions of monitoring are: monitoring the quality of atmospheric air, water, soil, and other components of the biosphere, determining the main sources of pollution, etc. Monitoring is distinguished by *the scale of generalization of information*: **global**, **national**, **regional**, **local**; by *management methods*: **biological** (using bioindicators), **remote** (aviation, space); by *objects of observation*: **atmospheric**, **air**, **water**, **soil**, **vegetation**, **animal world**, **population health**. Information is collected by hydrometeorological and sanitary-epidemiological stations, nature reserves (in the form of annals of nature), departments (in the form of natural resource inventories) according to a pre-established schedule at certain points and in a certain period using comparative methods of measurement and data collection.

МОНІТОРИНГ ДОВКІЛЛЯ – комплексна система спостережень, оцінки і прогнозу змін стану навколишнього середовища, направлена на забезпечення раціонального природокористування. М.д. – довгострокові спостереження за станом навколишнього природного середовища, його забрудненням та за природними явищами, які відбуваються в ньому, а також оцінка і прогноз стану навколишнього природного середовища та його забруднення.У зв'язку з просторово–часовими параметрами контролюючих процесів виділяють три класи систем моніторингу: **локальний, регіональний, глобальний.** У відповідності до мети контролю розрізняють три рівня моніторингу: **біоекологічний** (санітарний), **геоекологічний** (народно–господарський) та **біосферний.**

ENVIRONMENTAL MONITORING – a comprehensive system of observation, assessment, and forecasting of changes in the state of the environment, aimed at ensuring the rational use of nature. E.m. – long-term monitoring of the state of the natural environment, its pollution, and natural phenomena that occur in it, as well as assessment and forecasting of the state of the natural environment and its pollution. In connection with the spatial and temporal parameters of the controlling

processes, three classes of monitoring systems are distinguished: **local**, **regional**, and **global**. For control, three levels of monitoring are distinguished: **bioecological** (sanitary), **geoecological** (public and economic), and **biospheric**.

МОНІТОРИНГ ЗЕМЕЛЬ – система спостережень за станом земельного фонду для своєчасного виявлення змін, їх оцінки, попередження та усунення наслідків негативних процесів (Земельний кодекс України).

LAND MONITORING – a system of monitoring the state of the land fund for timely detection of changes, their assessment, prevention, and elimination of the consequences of negative processes (Land Code of Ukraine).

МОНІТОРИНГ ЛІСІВ – система спостережень, оцінки і прогнозу стану та динаміки лісового фонду, з метою державного управління в галузі використання, охорони, захисту лісового фонду та відтворення лісів і підвищення їх екологічних функцій (Лісовий кодекс України).

FOREST MONITORING – a system of observation, evaluation, and forecasting of the condition and dynamics of the forest fund, for state management in the field of use, protection, protection of the forest fund and reproduction of forests and improvement of their ecological functions (Forest Code of Ukraine).

НАВАНТАЖЕННЯ АНТРОПОГЕННЕ (техногенне) – міра прямого і непрямого впливу людини і народного господарства на природу в цілому або на її окремі компоненти (ландшафти, грунти, атмосферу, біоту та ін.).

ANTHROPOGENIC LOAD (technogenic) – a measure of the direct and indirect influence of man and the national economy on nature as a whole or its components (landscapes, soils, atmosphere, biota, etc.).

НАЦІОНАЛЬНЕ БАГАТСТВО КРАЇНИ – сукупність матеріальних благ, якими оперує суспільство; включає засоби виробництва, предмети споживання, природні ресурси, залучені до господарського використання. Нині Н.б.к. оцінюють не за економічними показниками, а за розмірністю середньої очікуваної тривалості життя населення з урахуванням коефіцієнта його захворюваності (більш об'єктивна оцінка).

THE NATIONAL WEALTH OF THE COUNTRY – a set of material goods with which society operates; includes means of production, consumer items, and natural resources involved in economic use. Now N.w.c. are evaluated not by economic indicators, but by the size of the average expected life expectancy of the population, taking into account its morbidity rate (a more objective assessment).

НАЦІОНАЛЬНІ ПРИРОДНІ ПАРКИ – природоохоронні, рекреаційні, культурно-освітні, науково-дослідні установи загальнодержавного значення, що створюються з метою збереження, відтворення та ефективного використання природних комплексів та об'єктів, які мають особливу природоохоронну, оздоровчу, історико-культурну, наукову, освітню та естетичну цінність та використовуються в природоохоранних, просвітницьких, наукових та культурних цілях і для регулюємого туризма. Основними завданнями Н.п.п. є збереження цінних природних та історико-культурних комплексів і об'єктів, створення умов для організованого туризму, відпочинку та інших видів рекреаційної діяльності в природних умовах, проведення наукових досліджень природних комплексів та їх змін, проведення екологічної освітньої роботи. На території Н.п.п. встановлюється диференційований режим щодо охорони їхніх природних комплексів та об'єктів, їх відтворення та використання за функціональним зонуванням.

В даний час виділяють чотири типи національних парків:

1. Відкритого типу, де вся або майже вся територія доступна для публіки;
2. Курортного типу – навколо кліматичних або бальнеологічних курортів, де доступ публіки відкритий або частково обмежений;
3. Напівзакритого типу, де на більшу частину території відвідувачів не допускають, і вона функціонує в режимі заповідника;
4. Заповідні національні парки, майже повністю закриті для туризму і зберігаються в інтересах науки.

NATIONAL NATURE PARKS – nature protection, recreation, cultural and educational, scientific and research institutions of national importance, created for preservation, reproduction, and effective use of natural complexes and objects that have special nature protection, health, historical, cultural, scientific, educational and aesthetic value and are used for nature protection, educational, scientific and cultural purposes and for regulated tourism. The main tasks of N.n.p. are the preservation of valuable natural and historical-cultural complexes and objects, the creation of conditions for organized tourism, rest, and other types of recreational activities in natural conditions, conducting scientific research on natural complexes and their changes, and carrying out ecological educational work. On the territory of N.n.p. a differentiated regime is established regarding the protection of their natural complexes and objects, their reproduction and use according to functional zoning.

Currently, there are four types of national parks:

1. Open type, where all or almost all territory is accessible to the public;
2. Resort-type – around climatic or balneological resorts, where public access is open or partially restricted;

3. Semi-closed type, where most of the territory is not open to visitors, and it functions as a nature reserve;

4. Protected national parks, almost completely closed to tourism and preserved in the interests of science.

НАТУРНІ ЛІСОВПОРЯДНІ РОБОТИ (далі – натурні роботи) – частина лісовпорядних робіт, які проводяться безпосередньо в лісі.

ON-SITE FORESTRY WORKS (hereinafter referred to as on-site works) – part of forest management works that are carried out directly in the forest.

ПРОДУКЦІЯ ПОЛЮВАННЯ – дика тварина чи її частина, добута (відловлена) чи набута будь-яким іншим шляхом з порушенням вимог цього Закону чи інших нормативно-правових актів, прийнятих відповідно до нього, що регулюють відносини у сфері користування природними ресурсами України.

HUNTING PRODUCT – a wild animal or its part, harvested (caught) or acquired in any other way in violation of the requirements of this Law or other normative legal acts adopted under it, which regulate relations in the sphere of use of natural resources of Ukraine.

НЕЗАКОННІ ВИРУБКИ ЛІСУ – це заготівля дерев та чагарників із порушенням норм діючого природоохоронного законодавства, зокрема, без спеціального дозволу на використання лісових ресурсів (лісорубний квиток, ордер).

ILLEGAL CUTTING OF FORESTS – the harvesting of trees and shrubs in violation of current environmental legislation, in particular, without a special permit for the use of forest resources (logging ticket, warrant).

НЕЗАКОННЕ ПОЛЮВАННЯ (браконьєрство) – полювання з порушенням вимог цього Закону та інших нормативно-правових актів, що стосуються полювання.

ILLEGAL HUNTING (poaching) – hunting in violation of the requirements of this Law and other legal acts related to hunting.

НЕРЕСТ – процес масового природнього відтворення водних біоресурсів, який відбувається протягом строку, обумовленого кліматичними та біологічними умовами.

SPAWNING – a process of mass natural reproduction of aquatic biological resources, which occurs during a period determined by climatic and biological

conditions.

НОРМА ВІДСТРІЛУ – встановлена кількість мисливських тварин, дозволена для добування одним мисливцем за визначений строк полювання.

SHOOTING NORM – the set number of game animals allowed for hunting by one hunter during the specified hunting period.

ОБ'ЄКТИ ОХОРОНИ НАВКОЛИШНОГО ПРИРОДНОГО СЕРЕДОВИЩА – природні компоненти навколишнього природного середовища, природні комплекси, ландшафт та інші об'єкти.

OBJECTS OF NATURAL ENVIRONMENT PROTECTION – natural components of the natural environment, natural complexes, landscape, and other objects.

ОБ'ЄКТИ РОСЛИННОГО СВІТУ – дикорослі та інші несільськогосподарського призначення судинні рослини, мохоподібні, водорості, лишайники, а також гриби на всіх стадіях розвитку та утворені ними природні угруповання.

OBJECTS OF THE PLANT WORLD – wild plants and other non-agricultural vascular plants, bryophytes, algae, lichens, as well as mushrooms at all stages of development and the natural groups formed by them.

ОБ'ЄКТ ТВАРИННОГО СВІТУ – організм тваринного походження (дика тварина) або їх популяція.

OBJECT OF THE ANIMAL WORLD – an organism of animal origin (wild animal) or their population.

ОЗЕРО – природна водойма в заглибленні суші (котлован) з уповільненим водообміном, безпосередньо не пов'язана з морем. Загальна площа озер нашої планети складає приблизно 2,1млн. км^2 (майже 1,4% площі суходолу). За походженням котлованів озера бувають:

***тектонічні*,** до яких належать найбільш глибокі і великі озера світу;

***вулканічні*,** які розміщуються в кратерах потухлих вулканів або серед лавинних полів;

льодовикові;

просадочні;

карстові;

річкові;

***морські*;**

***озера річкових дельт*;**
еолові;
штучні.

A LAKE – a natural body of water in a land depression (pit) with slow water exchange, not directly connected to the sea. The total area of the lakes of our planet is approximately 2.1 million. km^2 (almost 1.4% of the land area). According to the origin of pit, there are these types of lakes:

tectonic, which includes the deepest and largest lakes in the world;

volcanic, which are located in the craters of extinct volcanoes or among avalanche fields;

glacial;
low-grade;
karst;
river;
marine;
lakes of river deltas;
aeolian;
artificial.

ОСОБЛИВО ОХОРОННІ ПРИРОДНІ ТЕРІТОРІЇ – ділянки землі, водної поверхні і повітряного простору над ними, де розташовані природні комплекси та об'єкти, які мають особливе природоохоронне, наукове, культурне, естетичне, рекреаційне та оздоровче значення, які вилучено рішеннями органів державної влади повністю або частково з господарського використання і для яких встановлено режим особливої охорони.

SPECIALLY PROTECTED NATURAL TERRITORIES – areas of land, water surface, and air space above them, where natural complexes and objects are located, which have special nature protection, scientific, cultural, aesthetic, recreational, and health-improving significance, which have been removed by decisions of state authorities in whole or in part for economic use and for which a regime of special protection has been established.

ОХОРОНА ПРИРОДИ – система науково-обгрунтованих заходів (технологічних, економічних, адміністративно-правових, громадських та інших), спрямованих на раціональне використання природних ресурсів, збереження і відновлення природного потенціалу ландшафтів, що забезпечує збереження і відновлення природних багатств, попереджає прямий і непрямий шкідливий вплив результатів діяльності суспільства на природу і здоров'я людини.

NATURE PROTECTION – a system of science-based measures (technological, economic, administrative-legal, public, and others) aimed at the rational use of natural resources, the preservation and restoration of the natural potential of landscapes, which ensures the preservation and restoration of natural resources, prevents direct and indirect harmful effects the results of society's activities on nature and human health.

ОХОРОННА ПРИРОДНА ТЕРИТОРІЯ – простір (акваторія, територія), в межах якого забезпечується його охорона від господарської діяльності і підтримка природного стану для збереження економічної рівноваги. Режим охорони може бути заповідним, рекомендованим і комбінованим.

PROTECTIVE NATURAL TERRITORY – a space (water area, territory) within which its protection from economic activity and maintenance of the natural state to preserve economic balance is ensured. The protection mode can be protected, recommended, and combined.

ОЦІНКА ВПЛИВУ ЗАПЛАНОВАНОЇ ГОСПОДАРСЬКОЇ ТА ІНШОЇ ДІЯЛЬНОСТІ НА НАВКОЛИШНЄ СЕРЕДОВИЩЕ – процес, що сприяє прийняттю екологічно орієнтованого управлінського рішення про реалізацію запланованої господарської та іншої діяльності за допомогою визначення можливих несприятливих впливів, оцінки екологічних наслідків, врахування громадської думки, розробки заходів щодо зменшення та запобіганню впливів.

EVALUATION OF THE IMPACT OF PLANNED ECONOMIC AND OTHER ACTIVITIES ON THE ENVIRONMENT – a process that contributes to the adoption of an ecologically oriented management decision on the implementation of planned economic and other activities by determining possible adverse impacts, assessing environmental consequences, taking into account public opinion, developing measures to reduce and prevent impacts.

ОЦІНКА ПРИРОДНИХ РЕСУРСІВ – це визначення екологічної, гігієнічної, соціально-психологічної і інших цінностей природного об'єкта. Оцінка виражається переважно в екологічних показниках.

ASSESSMENT OF NATURAL RESOURCES – the definition of ecological, hygienic, socio-psychological, and other values of a natural object. The evaluation is mainly expressed in ecological indicators.

ПАМ'ЯТКИ ПРИРОДИ – окремі унікальні природні утворення, що мають особливе природоохоронне, наукове, естетичне і пізнавальне значення та повинні зберігатися в природному стані. На території П.п. забороняється будь-яка діяльність, що загрожує збереженню або призводить до деградації їх первісного стану. До П.п. відносяться природні комплекси, а також об'єкти природного і штучного походження, рідкісні або визначні об'єкти живої та неживої природи, що виділені під охорону на невеликій за розмірами території.

NATURAL MONUMENTS – individual unique natural formations that have special nature conservation, scientific, aesthetic, and cognitive significance and must be preserved in their natural state. On the territory of N.m., any activity that threatens the preservation or leads to the degradation of their original state is prohibited. To N.m. include natural complexes, as well as objects of natural and artificial origin, rare or significant objects of living and non-living nature, allocated for protection in a small area.

ПАРК МІСЬКИЙ – територія у межах міста з природними або штучними зеленими насадженнями у вигляді масивів, гаїв, куртин, груп, окремих дерев і кущів, живоплотів, зелених стінок, газонів, квітників тощо. Створений для організації масового відпочинку, окремих видів розваг, а також виховної та культурно-освітньої роботи. У парках розташовують атракціони, музеї, кафе, бари, ресторани, танцювальні та дитячі майданчики, кінотеатри, естрадні павільйони та ін.

CITY PARK – an area within the city with natural or artificial green spaces in the form of massifs, groves, curtains, groups, individual trees and bushes, hedges, green walls, lawns, flower gardens, etc. Created for the organization of mass recreation, certain types of entertainment, as well as educational and cultural work. Attractions, museums, cafes, bars, restaurants, dance and children's playgrounds, cinemas, pop pavilions, etc. are located in the parks.

ПАРК-ПАМ’ЯТКА САДОВО-ПАРКОВОГО МИСТЕЦТВА – об’єкт природнозаповідного фонду загальнодержавного або місцевого значення. Охоронний режим встановлюють для найвизначніших та найцінніших зразків паркового будівництва з метою їх охорони та використання в естетичних, виховних, наукових, природоохоронних та оздоровчих цілях. На їх території здійснюють догляд за насадженнями, включаючи санітарні рубки, рубки реконструкції та догляду, підсаджують дерева і кущі, вживають заходи щодо запобігання поширення самосіву, збереження газонів, квітникових рослин та композицій з дерев і кущів. Вони є місцем відпочинку населення, проведення

екскурсій.

PARK-MONUMENT OF GARDEN AND PARK ART – an object of a nature reserve fund of national or local significance. The protective regime is established for the most outstanding and valuable examples of park construction for their protection and use for aesthetic, educational, scientific, nature conservation, and health purposes. On their territory, plantations are cared for, including sanitary felling, reconstruction and maintenance felling, trees, and bushes are planted, measures are taken to prevent the spread of self-sowing, lawns, flowering plants, and tree and shrub compositions are preserved. They are a place for the population to rest and conduct excursions.

ПЕРЕБУДОВА ЛАНДШАФТУ ДОКОРІННА – необоротна зміна ландшафту, яка призводить до повної зміни його структури і властивостей (інваріанта) і тим самим до переходу в якісно нове утворення. П.л.д. може бути результатом цілеспрямованої діяльності людини, антропогенної деградації, стихійних природних процесів.

PERMANENT LANDSCAPE RECONSTRUCTION – an irreversible change in the landscape that leads to a complete change in its structure and properties (invariant) and thus to a transition into a qualitatively new formation. P.l.r. can be the result of purposeful human activity, anthropogenic degradation, or spontaneous natural processes.

ПОЛЕЗАХИСНІ ЛІСОВІ СМУГИ – лінійні лісові насадження, створені на рівнинних територіях (на зрошуваних та незрошуваних землях) для захисту орних земель та с.-г. рослин від несприятливих природних факторів; одна з груп захисних лісових насаджень. Вони відіграють важливу природоохоронну роль. П.л.с. знижують швидкість вітру, рівномірно затримують на полях сніг, зменшують поверхневий стік, підвищують вологість грунту, зменшують випаровування вологи, перешкоджають вивітрюванню грунтового покриву, оптимізують мікроклімат та гідрологічний режим території, захищають посіви с.-г. культур від вимерзання, посухи, суховіїв, пилових буревіїв та підвищують їх врожайність. П.л.с. закладають з однієї головної породи (чисті П.л.с.) або з декількох порід (мішані П.л.с.), що є найстійкішими для певної місцевості. Для України рекомендують створювати смуги з таких порід: тополя біла, канадська та пірамідальна, дуб червоний, модрина сибірська, береза повисла, робінія псевдоакація та інші. Створюють П.л.с. посадкою сіянців, садженців, черенків та посівом насіння; здебільшого вони 3–4-, інколи 1–2- або 5-рядні з відстанню між рядами 2,5–4 метрів, між окремими рослинами у ряду – 1–3 метри. П.л.с. розташовані впоперек дії найнебезпечніших вітрів – поздовжні,

або основні П.л.с., паралельно до них – поперечні П.л.с. Поперечні та поздовжні П.л.с. на стику між собою не з'єднують, залишаючи 20–30 метрів для с.-г. машин.

PROTECTIVE FOREST STRIPS – linear forest plantations created on flat areas (on irrigated and non-irrigated land) to protect arable land and rural areas. plants from adverse natural factors; one of the groups of protective forest plantations. They play an important environmental role. P.f.s. reduce wind speed, evenly retain snow on the fields, reduce surface runoff, increase soil moisture, reduce moisture evaporation, prevent weathering of the soil cover, optimize the microclimate and hydrological regime of the territory, protect agricultural crops. crops from freezing, drought, dry weather, and dust storms and increase their yield. P.f.s. are laid from one main breed (pure P.f.s.) or from several breeds (Mixed P.f.s.), which are the most resistant for a certain area. For Ukraine, it is recommended to create strips of the following species: white, Canadian, and pyramidal poplar, red oak, Siberian larch, hanging birch, robinia pseudoacacia, and others. They are creating P.f.s. planting seedlings, saplings, cuttings, and sowing seeds; mostly they are 3–4-, sometimes 1–2- or 5-row with a distance between rows of 2.5–4 meters, between individual plants in a row – 1–3 meters. P.f.s. are located across the action of the most dangerous winds – longitudinal or main P.f.s., parallel to them – transverse P.f.s. Transverse and longitudinal P.f.s. at the junction they are not connected, leaving 20–30 meters areas for agricultural machinery.

ПОЛЮВАННЯ – дії людини, спрямовані на вистежування, переслідування з метою добування і саме добування (відстріл, відлов) мисливських тварин, що перебувають у стані природної волі або утримуються в напіввільних умовах.

HUNTING – human actions aimed at tracking, chasing obtaining, and getting (shooting, catching) hunting animals that are in a state of natural will or kept in semi-free conditions.

ПОТЕНЦІАЛ ПРИРОДНОРЕСУРСНИЙ – теоретична кількість, природних ресурсів, які без шкоди для природи і людства можуть бути використані в господарських цілях.

NATURAL RESOURCE POTENTIAL – the theoretical amount of natural resources that can be used for economic purposes without harming nature and humanity.

ПОШИРЕНІСТЬ ВИДУ – кількісний показник, що використовується у екологічних дослідженнях для обліку ступеню присутності і поширення виду

(або декількох видів).

Для визначення поширеності виду використовується метод підрахунку на пробних вибіркових ділянках. Якщо досліджуваний вид зустрічається більше ніж на 50% площі, його поширеність є високою, якщо менше за 25% – він є випадковим.

SPECIES PREVALENCE – a quantitative indicator used in ecological studies to account for the degree of presence and distribution of a species (or several species).

To determine the prevalence of the species, the method of counting on test sample plots is used. If the studied species occurs in more than 50% of the area, its distribution is high, if it is less than 25%, it is random.

ПОСТІЙНИЙ ЛІСОКОРИСТУВАЧ – підприємства, установи, організації всіх форм власності, їх філії, представництва, відділення та інші відокремлені підрозділи, які мають у користуванні чи власності ліси на землях усіх категорій.

PERMANENT FOREST USER – enterprises, institutions, organizations of all forms of ownership, their branches, representative offices, branches, and other separate subdivisions that use or own forests on lands of all categories.

ПРИРОДНЕ ПОНОВЛЕННЯ – відновлення лісу природнім способом з насіння та кореневих і пневих паростків на площах зрубів та нелісових землях.

NATURAL RENEWAL – restoration of the forest in a natural way from seeds and root and stump sprouts on log areas and non-forest lands.

ПРИРОДНИЙ РЕЖИМ – поєднання природних середовищеутворювальних компонентів і дій, що утворюють традиційні екологічні умови життя організмів та їх угруповань.

NATURAL REGIME – a combination of natural environment-forming components and actions that form the traditional ecological conditions of life of organisms and their groups.

ПРИРОДОЗАПОВІДНИЙ ФОНД – сукупність природних об’єктів і комплексів, наділених режимом заповідності.

NATURE RESERVE FUND – a set of natural objects and complexes granted the status of a reserve.

ПРОГНОЗУВАННЯ ЕКОЛОГІЧНЕ – наукове передбачення або дослідження перспектив розвитку екосистем залежно від природних процесів

або впливу на них діяльності людини. П. е. за масштабом розрізняють глобальне, регіональне, національне і локальне.

ECOLOGICAL FORECASTING – a scientific prediction or study of prospects for the development of ecosystems depending on natural processes or the impact of human activity on them. According to the scale, E.f. is divided into global, regional, national, and local.

ПРОГРАМА ЕКОЛОГІЧНА – 1) програма, що спрямована на взаємну екологічну оптимізацію природних систем і виробничого комплексу, разом із охороною природи, довкілля; 2) набір задокументованих і затверджених природоохоронних заходів, сформованих згідно із визначеними пріоритетами і цілями екологічної політики з викладом необхідного ресурсного забезпечення та економічними і організаційно-правовими механізмами реалізації.

ECOLOGICAL PROGRAM – 1) a program aimed at the mutual ecological optimization of natural systems and the production complex, together with the protection of nature and the environment; 2) a set of documented and approved environmental protection measures, formed by the determined priorities and goals of the environmental policy with a description of the necessary resource provision and economic and organizational and legal mechanisms of implementation.

ПРОТОКА – водотік що відокремлює окремий морфологічний елемент складного річкового русла або з'єднує два водних об'єкта і не утворює типових, характерних річковому руслу комплексних рівуальних утворень.

STRAIT – a watercourse that separates a separate morphological element of a complex river bed or connects two water bodies and does not form typical complex rival formations characteristic of a river bed.

ПРОЦЕСИ ЕКОРЕГУЛЮВАЛЬНІ – існуючі на всіх рівнях біологічної і екологічної інтеграції процеси, які контролюють і підтримують стабільність життєдіяльності особин, їх кількість і біомасу. Як абіотичні (світло, температура, вологість тощо), так і біотичні (хижацтво, паразитизм, конкуренція тощо) чинники беруть участь у регуляції чисельності популяцій, видового різноманіття і біомаси біоценозів.

ECOREGULATORY PROCESSES – existing at all levels of biological and ecological integration, processes that control and support the stability of life activities of individuals, their number, and biomass. Both abiotic (light, temperature, humidity, etc.) and biotic (predation, parasitism, competition, etc.) factors are involved in the regulation of population size, species diversity, and biomass of

biocenoses.

ПРИБЕРЕЖНА ЗАХИСНА СМУГА – частина водоохоронної зони відповідної ширини вздовж річки, моря, навколо водойм, на якій встановлено більш суворий режим господарської діяльності, ніж на решті території водоохоронної зони.

COASTAL PROTECTIVE STRIP – a part of the water protection zone of the appropriate width along the river, the sea, and around reservoirs, on which a stricter regime of economic activity is established than in the rest of the territory of the water protection zone.

ПРИРОДНІ ЗАПОВІДНИКИ – природоохоронні, науково-дослідні установи загальнодержавного значення, що створюються з метою збереження в природному стані типових або унікальних для даної ландшафтної зони природних комплексів з усією сукупністю їх компонентів, підтримання природних спонтанних процесів і явищ, вивчення природних процесів і явищ, що відбуваються в них, розробки наукових засад охорони навколишнього природного середовища, ефективного використання природних ресурсів та екологічної безпеки.

NATURE RESERVES – nature conservation, scientific research institutions of national significance, created to preserve in their natural state typical or unique natural complexes with all their components, maintain natural spontaneous processes and phenomena, studying natural processes and phenomena that occur in them, development of scientific principles of environmental protection, effective use of natural resources and environmental safety.

ПРАВО ПРИРОДООХОРОННЕ – розділ міжнародного права і правової охорони природи держави, який розробляє юридичні основи збереження природних ресурсів і середовища життя.

ENVIRONMENT-PROTECTION LAW – a section of international law and the legal protection of nature of the state, which develops the legal basis for the preservation of natural resources and the living environment.

ПРАЛІСИ (ПРАЛІСОВІ ЕКОСИСТЕМИ) – споконвічний, стародавній ліс (природні лісові екосистеми), що сформувався природним шляхом і в ході розвитку не зазнав безпосереднього антропогенного впливу.

OLD-GROW FORESTS (OLD FOREST ECOSYSTEMS) – primordial, ancient forests (natural forest ecosystems) that formed naturally and did not undergo direct anthropogenic influence in the course of development.

ПРИМІСЬКА ЗЕЛЕНА ЗОНА – території навколо міст і промислових селищ, у тому числі лісопаркові захисні пояси, які виконують середовищезахисну (середовищеутворюючу, екологічну), санітарно-гігієнічну та рекреаційну функції.

SUBURBAN GREEN ZONE – territories around cities and industrial villages, including forest park protective belts, which perform environmental protection (environmental, ecological), sanitary, hygienic, and recreational functions.

ПРИРОДНИЙ ПАРК – природоохоронні рекреаційні установи, що знаходяться у веденні суб'єктів України, території (акваторії) яких включають в себе природні комплекси та об'єкти, що мають значну екологічну та естетичну цінність. П.п. призначені для використання в природоохоронних, просвітницьких і рекреаційних цілях.

NATURE PARK – nature protection recreation institutions managed by the subjects of Ukraine, the territories (water areas) of which include natural complexes and objects of significant ecological and aesthetic value. N.p. intended for use in nature conservation, educational, and recreational purposes.

ПРИРОДНИЙ ТЕРІТОРІАЛЬНИЙ КОМПЛЕКС – тип природного комплексу; просторово-часова система географічних компонентів, взаємообумовлених у своєму розміщенні, які розвиваються як єдине ціле. П.т.к характеризується пов'язаністю з деякою територією і позначає клас природних геосистем локальної та регіональної розмірності. Часто П.т.к вживається як родове поняття для позначення геосистем від фації (ландшафту елементарного) до ландшафту.

NATURAL TERRITORIAL COMPLEX – a type of natural complex; a spatiotemporal system of geographical components, mutually determined in their placement, which develop as a single entity. N.t.c is characterized by connection with a certain territory and denotes a class of natural geosystems of local and regional dimensions. Often N.t.c is used as a generic concept to denote geosystems from facies (elementary landscape) to landscape.

ПРИРОДНИЙ ФОН – фізичні, хімічні та інші показники, що характеризують незмінене людиною природне середовище, яке відображає рівень постійних (у межах природних багаторічних відхилень) параметрів того чи іншого природного фактора і дозволяє давати кількісну оцінку ефектів впливу людини на навколишнє середовище і окремі її компоненти.

NATURAL BACKGROUND – physical, chemical, and other indicators characterizing the natural environment unchanged by man, which reflects the level of constant (within natural multi-year deviations) parameters of one or another natural factor and allows a quantitative assessment of the effects of human influence on the environment and its components.

ПРИРОДНИЙ ЗАПОВІДНИК – природоохоронна науково-дослідна установа загальнодержавного значення, що створюється з метою збереження в природному стані типових або унікальних для даної ландшафтної зони природних комплексів з усією сукупністю їх компонентів, вивчення природних процесів і явищ, що відбуваються в них, розробки наукових засад охорони навколишнього природного середовища, ефективного використання природних ресурсів та екологічної безпеки. Основними завданнями П.з. є збереження природних комплексів та об'єктів на їхніх територіях, проведення наукових досліджень і спостережень за станом навколишнього природного середовища, розробка на їх основі природоохоронних рекомендацій.

NATURE RESERVE – a nature protection scientific research institution of national significance, which was created to preserve in their natural state typical or unique natural complexes with the entire set of their components, studying natural processes and phenomena occurring in them, developing scientific principles of environmental protection natural environment, effective use of natural resources and environmental safety. The main tasks of N.r. is the preservation of natural complexes and objects on their territories, conducting scientific research and observations on the state of the natural environment, and developing environmental recommendations based on them.

ПРИРОДНИЙ ЛАНДШАФТ – природний комплекс, територіально обмежений природними кордонами, в межах яких природні компоненти знаходяться в природній взаємодії один з одним.

NATURAL LANDSCAPE – a natural complex territorially limited by natural boundaries, within which natural components are in natural interaction with each other.

ПРИРОДНІ ЛІСИ (ПРИРОДНІ ЛІСОВІ ЕКОСИСТЕМИ) – ліси (лісові екосистеми), в яких локально і тимчасово проявився антропогенний вплив, але він не змінив ценотичної структури фітоценозів і тому природні лісові екосистеми здатні протягом короткого часу регенеруватися (відновитися) природним шляхом до стану пралісових екосистем.

NATURAL FORESTS (NATURAL FOREST ECOSYSTEMS) – forests

(forest ecosystems) in which anthropogenic influence was locally and temporarily manifested, but it did not change the cenotic structure of phytocenoses, and therefore natural forest ecosystems are capable of regenerating (restoring) naturally to the state of primeval forest ecosystems within a short time.

ПРИРОДНІ РЕСУРСИ – елементи природи, які споживаються суспільством, залучаються у виробництво та є його сировинною й енергетичною базою.

Класифікація П.р.:

– за джерелом і місцезнаходженням: **водні, повітряні, грунтові, рослинні, тваринні, мінеральні;**

– за швидкістю вичерпання: **вичерпні, невичерпні;**

– за можливістю самовідновлення та культивування: **відновлювані** (біологічні ресурси атмосфери, поверхневих вод) та **невідновлювані** (корисні копалини; види організмів, що вимерли);

– за швидкістю економічного відновлення за рахунок пошуку нових джерел або нових технологій: **відтворювані та невідтворювані**;

– за можливістю заміни одних ресурсів іншими: **замінні** (метал – пластмасою) та **незамінні** (атмосферний кисень).

NATURAL RESOURCES – elements of nature that are consumed by society, involved in production, and are its raw material and energy base.

Classification N.r.:

– by source and location: **water, air, soil, plant, animal, mineral**;

– according to the rate of depletion: **exhaustive, non-exhaustive**;

– according to the possibility of self-regeneration and cultivation: **renewable** (biological resources of the atmosphere, surface waters) and **non-renewable** (minerals; extinct species of organisms);

– according to the speed of economic recovery due to the search for new sources or new technologies: **reproducible** and **non-reproducible**;

– according to the possibility of replacing some resources with others: **replaceable** (metal-plastic) and **irreplaceable** (atmospheric oxygen).

ПРИРОДНО-ЗАПОВІДНИЙ ФОНД УКРАЇНИ – ділянки суші і водного простору, природні комплекси та об’єкти яких мають особливу природоохоронну, наукову, естетичну, рекреаційну та іншу цінність і виділені з метою збереження природної різноманітності ландшафтів, генофонду тваринного і рослинного світу, підтримання загального екологічного балансу та забезпечення фонового моніторингу навколишнього природного середовища.

NATURE RESERVE FUND OF UKRAINE – areas of land and water space, natural complexes, and objects which have a special environmental, scientific, aesthetic, recreational, and other value and are allocated to preserve the natural diversity of landscapes, the gene pool of animal and plant life, maintaining the overall ecological balance and providing background monitoring of the natural environment.

ПРИРОДНО-РЕСУРСНИЙ ПОТЕНЦІАЛ ТЕРИТОРІЇ – сукупність природних ресурсів, об'єктів, середовищеутворюючих факторів і умов (включаючи кліматичні, геологічні, гідрологічні та інші умови), які можуть бути використані в процесі господарської або іншої діяльності.

NATURAL RESOURCE POTENTIAL OF A TERRITORY – a set of natural resources, objects, environmental factors, and conditions (including climatic, geological, hydrological, and other conditions) that can be used in the process of economic or other activities.

ПРИРОДОКОРИСТУВАННЯ – різновид господарської діяльності; сукупність всіх форм використання природного, ресурсного потенціалу і заходів з його збереження. Види П.: гірничо-видобувна діяльність, будівництво, землеробство, тваринництво, переробна промисловість, рекреаційна діяльність, заповідна справа.

NATURE USE – a type of economic activity; the totality of all forms of use of natural, resource potential and measures to preserve it. Types of activities: mining, construction, agriculture, animal husbandry, processing industry, recreational activity, conservation business.

ПРИРОДОКОРИСТУВАЧ – підприємство, організація, а також громадянин України, іноземна юридична особа та громадянин, особа без громадянства, які здійснюють будь-які види діяльності на території України, пов'язані з природокористуванням.

NATURE USER – an enterprise, organization, as well as a citizen of Ukraine, a foreign legal entity, and a citizen, a stateless person, who carries out any type of activity on the territory of Ukraine related to nature management.

ПРИРОДООХОРОННІ ВИМОГИ – умови, обмеження або їх сукупність, що пред'являються до господарської діяльності з метою запобігання і (або) зниження її негативного впливу на навколишнє природне середовище та забезпечення екологічної безпеки.

ENVIRONMENTAL PROTECTION REQUIREMENTS – conditions,

restrictions, or their combination, imposed on economic activity to prevent and (or) reduce its negative impact on the natural environment and ensure environmental safety.

ПРИРОДООХОРОННІ НОРМАТИВИ навколишнього природного середовища – встановлені нормативи якості навколишнього природного середовища та нормативи допустимого впливу на неї, при яких забезпечується якість навколишнього природного середовища, необхідна для життєдіяльності людини, існування тварин, рослин та інших живих організмів.

ENVIRONMENTAL PROTECTION STANDARDS of the natural environment – established standards of the quality of the natural environment and standards of permissible impact on it, which ensure the quality of the natural environment necessary for human life, the existence of animals, plants, and other living organisms.

РАДІАЦІЙНИЙ ФОН – 1) фон зовнішнього опромінення, яке проникає в живі організми. Р. ф. зумовлений наявністю в земній корі, ґрунті, повітрі, воді, живих організмах радіоактивних ізотопів природного і штучного походження, а також радіонуклідів, які безперервно утворюються при взаємодії космічних променів із атомами ядер середовища існування; 2) еквівалентна доза іонізуючого опромінення від природних джерел іонізуючого випромінювання космічного і земного походження, а також від штучних радіонуклідів, розсіяних у біосфері внаслідок діяльності людини. Р. ф. вимірюється потужністю експозиційної дози, яка на місцевості реєструється в повітрі на висоті 1,1 м від поверхні землі.

RADIATION BACKGROUND – 1) the background of external radiation that penetrates living organisms. R. b. caused by the presence in the earth's crust, soil, air, water, and living organisms of radioactive isotopes of natural and artificial origin, as well as radionuclides, which are continuously formed during the interaction of cosmic rays with the atoms of the nuclei of the environment; 2) the equivalent dose of ionizing radiation from natural sources of ionizing radiation of cosmic and terrestrial origin, as well as from artificial radionuclides scattered in the biosphere as a result of human activity. R. b. is measured by the power of the exposure dose, which is recorded in the air at a height of 1.1 m from the ground surface.

РАДІОАКТИВНІСТЬ – 1) властивість радіонуклідів спонтанно перетворюватися на атоми інших елементів (стабільні або радіоактивні нукліди) унаслідок переходу ядра з одного енергетичного стану в інший, що

супроводжується іонізуючим випромінюванням; 2) мимовільне перетворення нестійких атомних ядер у ядра ін. елементів, що супроводжується випущенням іонізуючих випромінювань. Відомі чотири типи Р.: альфа-розпад, бета-розпад, протонна (двопротонна) Р. і розділення ядер. Одиниці виміру Р. – несистемні: кюрі (Кі) і бекерель (Бк – у системі СІ). 1 Кі = $3{,}7 \cdot 10^{10}$ Бк. Частіше оцінюється питома активність радіоактивних матеріалів, віднесена до одиниць маси або об'єму (Бк/кг$^{-1}$, Бк/л$^{-1}$, Бк/м$^{-3}$ та ін.).

RADIOACTIVITY – 1) the property of radionuclides to spontaneously transform into atoms of other elements (stable or radioactive nuclides) as a result of the transition of the nucleus from one energy state to another, accompanied by ionizing radiation; 2) involuntary transformation of unstable atomic nuclei into the nuclei of others. elements, which is accompanied by the release of ionizing radiation. Four types of decay are known: alpha decay, beta decay, proton (two-proton) decay, and nuclear fission. Units of measurement of R. are non-systemic: curie (Ki) and becquerel (Bk – in the SI system). 1 Ki = $3.7 \cdot 10^{10}$ Bk. More often, the specific activity of radioactive materials is estimated, referred to as units of mass or volume (Bq/kg^{-1}, Bq/l^{-1}, Bq/m^{-3}, etc.).

РАДІОАКТИВНІСТЬ АТМОСФЕРИ – вміст в атмосфері радіоактивних домішок (гази, аерозолі) природного й штучного походження. Практичний інтерес становлять природні радіоактивні води, що містять підвищений уміст радіоактивних елементів — радію, радону, урану (природні ізотопи). Такі води використовують у лікувальних цілях.

RADIOACTIVITY OF THE ATMOSPHERE – the content of radioactive impurities (gases, aerosols) of natural and artificial origin in the atmosphere. Of practical interest are natural radioactive waters containing a high content of radioactive elements – radium, radon, and uranium (natural isotopes). Such waters are used for medicinal purposes.

РАДІОАКТИВНІСТЬ ҐРУНТІВ – здатність ґрунтів випромінювати альфа-, бета-промені, що зумовлена наявністю в ґрунті і материнських породах природних і штучних радіонуклідів. У групу природних радіонуклідів входять ^{235}U, ^{238}U, ^{232}Th і продукти їхнього розпаду (Ra, Rn і ін.), а також ^{40}K, ^{87}Rb, ^{14}C, і ^{3}H. Крім природних радіонуклідів, відомо понад 1300 штучних, найбільш важливими з них є ^{90}Sr, ^{137}Cs, ^{131}J, ^{80}Kr.

SOIL RADIOACTIVITY – the ability of soils to emit alpha and beta rays, which is caused by the presence of natural and artificial radionuclides in the soil and parent rocks. The group of natural radionuclides includes ^{235}U, ^{238}U, ^{232}Th and their decay products (Ra, Rn, etc.), as well as ^{40}K, ^{87}Rb, ^{14}C, and ^{3}H. In addition to natural

radionuclides, more than 1,300 artificial ones are known, the most important of which are ^{90}Sr, ^{137}Cs, ^{131}J, and ^{80}Kr.

РАДІОАКТИВНІСТЬ НАВКОЛИШНЬОГО ПРИРОДНОГО СЕРЕДОВИЩА – зумовлена вмістом природних радіонуклідів у різних природних об'єктах: земній корі, ґрунті, водоймах, атмосфері, біосфері. Важливим чинником, що визначає радіоактивність навколишнього природного середовища, є діяльність людини. Характер розповсюдження радіоактивних елементів у Р.н.п.с. зумовлює їх зовнішній і внутрішній вплив па організм людини.

RADIOACTIVITY OF THE SURROUNDING NATURAL ENVIRONMENT – is determined by the content of natural radionuclides in various natural objects: the earth's crust, soil, reservoirs, atmosphere, and biosphere. An important factor determining the radioactivity of the natural environment is human activity. The nature of the distribution of radioactive elements in the R.n.p.s. determines their external and internal impact on the human body.

РАДІОАКТИВНІСТЬ ПРИРОДНА – 1) властивість природного середовища, абіотичних і біотичних об'єктів утворювати характерне випромінювання, яке пов'язане із вмістом у них різних радіоактивних ізотопів; 2) присутність у земній корі, ґрунті, повітрі, рослинних і тваринних організмах радіоактивних ізотопів природного походження, а також радіонуклідів, що безперервно утворюються за взаємодії космічних променів з ядрами атомів. Радіоактивність повітря і вод природна у середньому на 2–4 рівні нижча, ніж гірських порід і ґрунтів.

NATURAL RADIOACTIVITY – 1) property of the natural environment, abiotic and biotic objects to generate characteristic radiation, which is associated with the content of various radioactive isotopes in them; 2) the presence in the earth's crust, soil, air, plant, and animal organisms of radioactive isotopes of natural origin, as well as radionuclides that are continuously formed by the interaction of cosmic rays with the nuclei of atoms. The radioactivity of natural air and water is on average 2–4 levels lower than that of rocks and soils.

РАДІОАКТИВНІСТЬ ШТУЧНА – радіоактивність, яка зумовлена господарською, військовою діяльністю людей і пов'язана з утворюванням і використанням радіоактивних ізотопів.

ARTIFICIAL RADIOACTIVITY – radioactivity caused by economic and military activities of people and associated with the formation and use of radioactive isotopes.

РАДІОАКТИВНО ЗАБРУДНЕНІ ЗЕМЛІ – землі, що мають потребу в застосуванні заходів радіаційного захисту й інших спеціальних втручань, спрямованих на обмеження додаткового опромінення, зумовленого Чорнобильською катастрофою, і забезпечення нормальної господарської діяльності. До таких земель належать території зон гарантованого добровільного відселення й зон посиленого радіоекологічного контролю.

RADIOACTIVELY CONTAMINATED LANDS – lands that require the application of radiation protection measures and other special interventions aimed at limiting additional exposure caused by the Chornobyl disaster and ensuring normal economic activity. Such lands include the territories of zones of guaranteed voluntary resettlement and zones of enhanced radioecological control.

РАДІОБІОІНДИКАТОРИ – організми (популяції, види), за якими визначають наявність концентрації і розподіл радіоактивних речовин у довкіллі. Наприклад, Р. б. і. є корені бобових рослин, лишайники.

RADIOBIO-INDICATORS – organisms (populations, species) that determine the presence and distribution of radioactive substances in the environment. For example, R.-b. i. there are roots of leguminous plants, lichens.

РАДІОБІОЛОГІЯ – галузь науки про дію усіх видів іонізуючого випромінювання на живі організми, їхні співтовариства й біосферу в цілому. Дослідження біологічної дії іонізуючих випромінювань почалося майже після відкриття цих випромінювань В.К. Рентгеном (1895), А. Бекерелем (1896) і радію М. Склодовською-Кюрі і П. Кюрі (1898). Однак, як самостійна наука Р. сформувалася в І-й половині XX ст. завдяки швидкому розвиткові ядерної фізики й техніки. Основою проблеми Р. є: дослідження радіаційного ураження організмів при тотальному опромінюванні, вивчення причин різної радіосприйняття організмів, вишукування різних засобів захисту організму від випромінювань і шляхів його пострадіаційного відновлення від ушкоджень, прогнозування небезпеки для людства рівня радіації, що підвищується, навколишнього середовища, вишукування нових шляхів використання іонізуючих випромінювань у медицині, с.–г., харчовій і мікробіологічній промисловості. Багатогранність завдань, що постали перед сучасною Р., сприяли розвитку радіоекології, радіаційної генетики, космічної радіобіології, радіаційної мікробіології та інших напрямів.

RADIOBIOLOGY – a branch of science dealing with the effects of all types of ionizing radiation on living organisms, their communities, and the biosphere as a whole. The study of the biological effect of ionizing radiation began almost after the

discovery of these radiations by V.K. Roentgen (1895), A. Becquerel (1896), and radium by M. Sklodovska-Curie and P. Curie (1898). However, an independent science of R. was formed in the 1st half of the 20th century. thanks to the rapid development of nuclear physics and technology. The basis of R.'s problem is the study of radiation damage to organisms during total irradiation, the study of the causes of different radio perceptions of organisms, the search for various means of protecting the organism from radiation, and the ways of its post-radiation recovery from damage, forecasting the danger to humanity of the rising level of radiation, the environment, the search for new ways of using ionizing radiation in medicine, p. g., food, and microbiological industry. The multifaceted tasks facing modern Russia contributed to the development of radioecology, radiation genetics, space radiobiology, radiation microbiology, and other areas.

РАДІОЕКОЛОГІЯ – галузь екології, що вивчає розподіл, міграцію і кругообіг радіонуклідів у біосфері і вплив іонізуючого випромінювання на екологічні системи (біогеоценози, популяції організмів). Розрізняють Р. е. надземних біогеоценозів і Р. е. гідробіоценозів (морську і прісноводну).

RADIOECOLOGY – a branch of ecology that studies the distribution, migration, and circulation of radionuclides in the biosphere and the impact of ionizing radiation on ecological systems (biogeocenoses, populations of organisms). A distinction is made between the R. e. of terrestrial biogeocenoses and the R. e. hydrobiocenoses (marine and freshwater).

РАМСАРСЬКА КОНВЕНЦІЯ – конвенція про водно-болотні угіддя, що мають міжнародне значення, головним чином як середовища існування водоплавних птахів. Підписана 02.02.1971 р. у м. Рамсар (Іран). Україну визнано правонаступницею СРСР щодо участі в конвенції від 26.12.1975 р. Законом України від 29.10.1996 р. в Україні налічується 33 водно-болотних угіддя Рамсарського списку, ще 23 – перспективні до включення.

RAMSAR CONVENTION – a convention on wetlands of international importance, mainly as habitats for waterfowl. Signed on 02.02.1971 in the city of Ramsar (Iran). Ukraine was recognized as the legal successor of the USSR for participation in the convention of December 26, 1975. According to the Law of Ukraine dated October 29, 1996, there are 33 wetlands on the Ramsar list in Ukraine, and another 23 are promising for inclusion.

РЕАБІЛІТАЦІЯ ЗАБРУДНЕНИХ ТЕРИТОРІЙ – застосування комплексу заходів, що спрямовані на відновлення порушених зміною радіологічної ситуації виробничих, економічних, соціально-психологічних та

інших відносин і дають змогу без обмежень вести господарську діяльність. Під повною Р. з. т. розуміється процес забезпечення безпечних умов проживання й роботи людини на забрудненій території із забезпеченням упевненості її в тому, що ці умови не відрізняються від умов на будь-якій іншій території країни.

REHABILITATION OF CONTAMINATED TERRITORIES – application of a set of measures aimed at restoring industrial, economic, social-psychological, and other relations disrupted by a change in the radiological situation and enabling unrestricted economic activity. Under the full R. c. t. means the process of ensuring safe living and working conditions for a person in a contaminated area, ensuring his confidence that these conditions do not differ from conditions in any other territory of the country.

РЕГРЕС БІОЛОГІЧНИЙ – явище, що характеризується зменшенням кількості особин регресуючої групи організмів, звуженням ареалу та його розірваністю, зменшенням різноманітності форм і кількості підлеглих систематичних груп унаслідок відставання темпів еволюції від змін в умовах існування.

BIOLOGICAL REGRESSION – a phenomenon characterized by a decrease in the number of individuals of a regressing group of organisms, a narrowing of the range and its discontinuity, a decrease in the diversity of forms and the number of subordinate systematic groups as a result of the pace of evolution lagging behind changes in the conditions of existence.

РЕГУЛЮВАННЯ ЧИСЕЛЬНОСТІ ДИКИХ ТВАРИН – вилучення (відстріл та відлов) диких тварин, що перебувають у стані природної волі, за умови, що їх чисельність на конкретній території загрожує життю та здоров'ю людей, свійських тварин, завдає значних збитків сільському, лісовому чи мисливському господарству, порушує природний баланс видів, загрожує існуванню інших видів диких тварин.

REGULATION OF THE NUMBER OF WILD ANIMALS – removal (shooting and trapping) of wild animals in a state of natural will, provided that their number in a specific territory threatens the life and health of people, domestic animals, causes significant damage to agriculture, forestry or hunting, disrupts the natural balance of species, threatens the existence of other species of wild animals.

РЕГУЛЮВАННЯ ЕКОЛОГІЧНЕ – система активних законодавчих, адміністративних та економічних заходів і важелів впливу, які

використовують державні органи різного рівня для примушення забруднювачів навколишнього середовища обмежити викиди шкідливих речовин у природні й техногенні середовища, а також для матеріального стимулювання сумлінних природокористувачів.

ENVIRONMENTAL REGULATION – a system of active legislative, administrative, and economic measures and levers of influence, which are used by state bodies of various levels to force environmental polluters to limit emissions of harmful substances into natural and man-made environments, as well as to materially stimulate conscientious nature users.

РЕГУЛЮВАННЯ ЕКОЛОГІЧНИХ СИТУАЦІЙ – система дій і заходів різноманітного характеру (технологічного, правового, економічного, науково-інформаційного тощо), за допомогою яких суспільство, людина пристосовується до екологічних ситуацій і змінює їх у певних межах. Дії щодо Р. е. с. можуть бути активними, нормативними та адитивними.

REGULATION OF ENVIRONMENTAL SITUATIONS – a system of actions and measures of a diverse nature (technological, legal, economic, scientific and informational, etc.), with the help of which society, man adapts to environmental situations and changes them within certain limits. Actions regarding R. e. s. can be active, normative, and additive.

РЕГУЛЯЦІЯ ПОПУЛЯЦІЇ – прагнення популяції до відновлення їх величини (чисельності) відповідно до стану збалансованості.

REGULATION OF THE POPULATION – the desire of the population to restore their size (number) by the state of balance.

РЕДУЦЕНТ – 1) організм, який перетворює у процесі життєдіяльності складні органічні речовини у прості неорганічні сполуки, що можуть засвоюватись іншими організмами; 2) організм, переважно мікроорганізм, який розкладає рослинні і тваринні рештки до рівня вихідних неорганічних речовин.

REDUCER – 1) an organism that transforms complex organic substances into simple inorganic compounds that can be assimilated by other organisms in the process of vital activity; 2) an organism, mainly a microorganism, which decomposes plant and animal remains to the level of original inorganic substances.

РЕЖИМ ЗАКАЗНИКА – обмеження господарської діяльності, часткова охорона природного комплексу, яка забезпечує збереження об'єкта

(наприклад, популяції), групи об'єктів або ландшафту загалом. Характерною ознакою Р.з., незалежно від суворості охорони, є її спрямованість на збереження чи посилений розвиток одного з компонентів, що утворюють середовище, або одного з об'єктів природного комплексу.

NATURE RESERVE MODE – restriction of economic activity, partial protection of the natural complex, which ensures the preservation of an object (for example, a population), a group of objects, or the landscape in general. A characteristic feature of N. r. m., regardless of the strictness of protection, is its focus on the preservation or enhanced development of one of the components that make up the environment, or one of the objects of the natural complex.

РЕЖИМ ЗАПОВІДНИЙ – повне невтручання людей в природні процеси або обмеження їх втручання для підтримання екологічної рівноваги, спрямоване на збереження видів живих організмів та їх спільнот.

PRESERVATIVE MODE – complete non-interference of people in natural processes or limitation of their intervention to maintain ecological balance, aimed at preserving species of living organisms and their communities.

РЕЗЕРВАТ – охоронна природна територія з режимом, близьким до режиму заповідника, де головним об’єктом охорони є один із елементів природного комплексу.

RESERVE is a protected natural territory with a regime close to that of a nature reserve, where the main object of protection is one of the elements of the natural complex.

РЕІНТРОДУКЦІЯ – інтродукція рослин у місця, де вид раніше існував, а потім зник, переважно, з вини людини.

REINTRODUCTION – the introduction of plants to places where the species used to exist, and then disappeared, mostly due to human fault.

РЕКРЕАЦІЙНА ЗОНА – природна або спеціально організована територія, де жителі населеного пункту проводять дозвілля (парки, сквери, національні парки та ін.).

RECREATION ZONE – a natural or specially organized territory where residents of a settlement spend their leisure time (parks, squares, national parks, etc.).

РЕЛІКТИ – види (угруповання) рослинних і тваринних організмів,

зазвичай рідкісних, раніше широко поширених, які залишились існувати на незначній території, і збереглися з минулих геологічних часів. Розрізняють релікти третинні, плейстоценові, неогенові.

RELICS – types (groups) of plant and animal organisms, usually rare, previously widespread, which remained to exist in a small area, and were preserved from past geological times. Tertiary, Pleistocene and Neogene relics are distinguished.

РЕСУРСИ БІОЛОГІЧНІ – біологічні компоненти біосфери, створені життєдіяльністю продуцентів, консументів і редуцентів. Джерела і передумови отримання необхідних людям матеріальних і духовних благ, закладені в об'єктах живої природи – всіх живих середовище утворюючих компонентах біосфери.

BIOLOGICAL RESOURCES – biological components of the biosphere, created by the activities of producers, consumers, and reducers. The sources and prerequisites for obtaining the material and spiritual benefits necessary for people are laid in the objects of living nature – all living environment-forming components of the biosphere.

РЕСУРСИ ПРИРОДНІ – природні багатства або елементи природи, які споживаються суспільством, залучаються у виробництво та є його сировинною та енергетичною основою. Р.п. поділяються на невичерпні (енергія вітру, сонця, хвиль, води, підземне тепло землі тощо), вичерпні та невідновлювальні (корисні копалини). Живі організми (рослини, тварини), ґрунти відносяться до частково відновлювальних.

NATURAL RESOURCES – natural wealth or elements of nature that are consumed by society, involved in production, and are its raw material and energy basis. N.r. are divided into inexhaustible (energy of wind, sun, waves, water, underground heat of the earth, etc.), exhaustible, and non-renewable (minerals). Living organisms (plants, animals), and soils are partially renewable.

РЕФУГІУМ (РЕФУГІЯ) – автохтонний залишок території з оптимальними умовами існування популяцій реліктових видів флори, фауни.

REFUGIUM – an autochthonous remnant of the territory with optimal conditions for the existence of populations of relict species of flora and fauna.

РИЗИК ЕКОЛОГІЧНИЙ – імовірність навмисних або випадкових, поступових і катастрофічних антропогенних змін існуючих природних об'єктів, чинників, ресурсів.

ENVIRONMENTAL RISK – the probability of intentional or accidental, gradual and catastrophic anthropogenic changes in existing natural objects, factors, and resources.

РИЗИК ПРИРОДОКОРИСТУВАННЯ – можливість негативних наслідків за будь-якого рішення глобальної, регіональної або локальної експлуатації природних ресурсів і в процесі використання споруд, технологічних ліній тощо.

RISK OF NATURE USE – the possibility of negative consequences for any decision of global, regional, or local exploitation of natural resources and in the process of using buildings, technological lines, etc.

РІВНІ ОРГАНІЗАЦІЇ ЖИВОЇ ПРИРОДИ – уявлення про ієрархічну структурність живої природи. Виділяють такі Р. о. ж. п.: молекулярно-генетичний, клітинний, органо-тканинний, організмовий, популяційно-видовий, біоценотичний, біосферний. За структурою, системи складаються з підсистем.

LEVELS OF ORGANIZATION OF LIVING NATURE – an idea of the hierarchical structure of living nature. The following L. o. l. n.: molecular-genetic, cellular, organ-tissue, organismic, population-species, biocenotic, biospheric. By structure, systems consist of subsystems.

РІВНІ ТРОФІЧНІ – сукупність організмів, що об’єднані типом живлення, характеризується певною формою організації та утилізації енергії. На кожному Р. т. засвоєна їжа асимілюється не повністю, і значна її частина втрачається, використовуючись на обмін. Продукція організмів кожного наступного Р. т. завжди менша (в середньому у 10 разів). Співвідношення Р. т. наочно може бути представлене у вигляді екологічної піраміди.

TROPHIC LEVELS – a set of organisms united by the type of nutrition, characterized by a certain form of organization and utilization of energy. At each T.l., the assimilated food is not completely assimilated, and a significant part of it is lost, being used for exchange. The production of organisms in each subsequent T. l. is always smaller (on average by 10 times). The ratio of T. l. can be visually represented in the form of an ecological pyramid.

РІВНОВАГА БІОЛОГІЧНА – прагнення природних комплексів до збереження динамічної стабільності.

BIOLOGICAL BALANCE – the desire of natural complexes to maintain dynamic stability.

РІВНОВАГА ЕКОЛОГІЧНА – стан екосистеми, виникаючий при досягненні відповідності між її біотичними і абіотичними компонентами.

ECOLOGICAL BALANCE – the state of the ecosystem that occurs when the biotic and abiotic components are in harmony.

РІВНОВАГА ПРИРОДНА – екологічна рівновага, яка утворюється на основі постійних або мало змінених людською діяльністю середовище-утворюючих компонентів і природних процесів. Індикатором Р. п. слугує здатність екосистем розвиватись до досягнення клімаксних фаз сукцесії. Р. п. – сума процесів і явищ, які відбуваються в установлених природних угрупованнях. Р. п. може не зворотно порушуватись за антропогенного впливу, але може переходити і в природно-антропогенну рівновагу.

NATURAL EQUILIBRIUM – an ecological balance that is formed based on constant or little change by human activity environment-forming components and natural processes. The ability of ecosystems to develop before reaching the climactic phases of succession serves as an indicator of N. e. is the sum of processes and phenomena that occur in established natural groups. N. e. may not be irreversibly disturbed under anthropogenic influence, but it may also move into a natural-anthropogenic equilibrium.

РІЗНОМАНІТТЯ БІОЛОГІЧНЕ – 1) об’єктивне різноманіття, варіабельність видового складу біоценозів усіх екосистем; 2) сукупність усіх видів рослин, тварин і мікроорганізмів, їх угруповань у межах території країни, її територіальних та внутрішніх морських вод, виключної (морської) економічної зони та континентального шельфу. Р. б. складається з видового, популяційного, ценотичного та генетичного різноманіття.

BIOLOGICAL DIVERSITY – 1) objective diversity, variability of the species composition of biocenoses of all ecosystems; 2) the totality of all types of plants, animals, and microorganisms, their groups within the territory of the country, its territorial and internal sea waters, the exclusive (marine) economic zone and the continental shelf. B. d. consists of species, population, coenotic, and genetic diversity.

САНІТАРНО-ЗАХИСНА ЗОНА – функціональна територія між промисловим підприємством або іншим виробничим об'єктом, що є джерелом надходження шкідливих чинників у НПС, і найближчою житловою забудовою (чи прирівняними до неї об'єктами), яка створюється для зменшення залишкового впливу цих факторів до рівня гігієнічних нормативів із метою захисту населення від їх несприятливого впливу. С.з.з. створюються навколо

об'єктів, які є джерелами виділення шкідливих речовин, запахів, підвищених рівнів шуму, вібрації, ультразвукових і електромагнітних хвиль, електронних полів, іонізуючих випромінювань тощо, з метою відокремлення таких об'єктів від територій житлової забудови. У межах санітарно-захисних зон забороняється будівництво житлових об'єктів, об'єктів соціальної інфраструктури та інших об'єктів, пов'язаних із постійним перебуванням людей.

SANITARY-PROTECTIVE ZONE – a functional territory between an industrial enterprise or other production facility, which is a source of inflow of harmful factors into the NPS, and the nearest residential building (or facilities equivalent to it), which is created to reduce the residual impact of these factors to the level hygienic standards to protect the population from their adverse effects. S.p.z. are created around objects that are sources of release of harmful substances, odors, increased noise levels, vibration, ultrasonic and electromagnetic waves, electronic fields, ionizing radiation, etc., to separate such objects from residential areas. The construction of residential facilities, social infrastructure facilities, and other facilities related to the permanent residence of people is prohibited within the sanitary protection zones.

САМОЗАЛІСЕНА ДІЛЯНКА – земельна ділянка будь-якої категорії земель (крім земель лісогосподарського призначення, природно-заповідного та іншого природоохоронного призначення) площею понад 0,5 гектара, вкрита частково чи повністю лісовою рослинністю, залісення якої відбулося природним шляхом.

SELF-FORESTED PLOT – a plot of land of any category of land (except lands for forestry purposes, nature reserves, and other nature protection purposes) with an area of more than 0.5 hectares, partially or completely covered with forest vegetation, the afforestation of which occurred naturally.

СЕЗОН ПОЛЮВАННЯ – період року (конкретна дата початку та закінчення), протягом якого дозволяється полювання на певний вид мисливських тварин. С. п. – період року (конкретна дата початку та закінчення), протягом якого дозволяється полювання на певний вид мисливських тварин.

HUNTING SEASON – time of the year (specific start and end date) during which hunting of a certain type of game animal is allowed. H. s. – time of the year (specific start and end date) during which hunting of a certain type of game animal is allowed.

СЕЛІТЕБНА ТЕРИТОРІЯ (ЗОНА) – частина території населеного пункту, зайнята житловими будівлями, зеленими насадженнями, спортивними спорудами, місцями короткочасного відпочинку населення, а також призначена для їх розміщення в майбутньому.

RESIDENTIAL TERRITORY (ZONE) – a part of the territory of a settlement, occupied by residential buildings, green spaces, sports facilities, places for short-term recreation of the population, and also intended for their placement in the future.

СІНОКІС ЛІСОВИЙ – землі, придатні для заготівлі сіна (сінокосіння). С. л. виділяють на основі матеріалів лісовпорядкування, землевпорядкування тощо. До С. л. відносять придатні для сінокосіння сільськогосподарські угіддя на нелісових землях, а також лісові, не покриті лісом землі (обезлісені вирубки, прогалини тощо), на яких не очікується природного лісовідновлення (до створення на них лісових культур), і ділянки, що вимагають заходів з їх поліпшення (осушення, знищення купин тощо). У разі необхідності під С. л. можуть використовуватися малоцінні ділянки лісу, що не підлягають реконструкції.

FOREST HAYING – land suitable for harvesting hay (haymaking). F. h. allocated based on forest management materials, land management, etc. To F. h. include agricultural lands on non-forest lands suitable for haying, as well as forest lands not covered by forests (deforested clearings, gaps, etc.), on which natural reforestation is not expected (before the establishment of forest crops on them), and areas that require measures to improve them (drainage, destruction of mounds, etc.). If necessary under F. h. low-value areas of the forest that are not subject to reconstruction can be used.

СІЯНЕЦЬ ЛІСОВИЙ – молода деревна або чагарникова рослина, вирощена з насіння у відкритому або закритому ґрунті посівного відділення розплідника (без пересадження), що використовується як посадковий матеріал.

FOREST SEEDLING – a young tree or shrub plant, grown from seeds in the open or closed soil of the sowing department of the nursery (without transplanting), which is used as planting material.

СТАБІЛЬНІСТЬ ЕКОЛОГІЧНА – спроможність екосистеми (ландшафту) протидіяти абіотичним та біотичним чинникам середовища (у т.ч. і антропогенним). С. е. розглядається як екологічний баланс. Вирішальне

значення має співвідношення автотрофів (продуцентів) і гетеротрофів (консументів і редуцентів), а також специфічна адаптація організмів один до одного і до середовища.

ENVIRONMENTAL STABILITY – the ability of the ecosystem (landscape) to counteract abiotic and biotic factors of the environment (including anthropogenic ones). E. s. is considered as ecological balance. The ratio of autotrophs (producers) and heterotrophs (consumers and reducers), as well as the specific adaptation of organisms to each other and the environment, is of decisive importance.

СТАБІЛЬНІСТЬ ЕКОСИСТЕМИ – здатність протистояти будьяким впливам і повертатись до початкового стану.

ECOSYSTEM STABILITY – the ability to resist any impacts and return to the initial state.

СТАНДАРТ ЕКОЛОГІЧНИЙ – кількісний або якісний показник природних об'єктів, що має юридичну значимість. С.е. – один з інструментів правового регулювання державою якості навколишнього середовища; відповідно до нього встановлюється правовий режим використання окремих природних ресурсів, екологічні правила діяльності в сферах, не пов'язаних з використанням природних ресурсів. С.е. володіє всіма рисами правових актів і входить в систему права, представляючи другий етап в розробці законодавчих заходів в боротьбі із забрудненням навколишнього середовища (на першому – законодавчо формуються якісні параметри природного середовища).

ENVIRONMENTAL STANDARD – a quantitative or qualitative indicator of natural objects that has legal significance. E.s. – one of the instruments of legal regulation of environmental quality by the state; following it, the legal regime for the use of individual natural resources, environmental rules of activity in areas not related to the use of natural resources are established. E.s. has all the features of legal acts and is part of the legal system, representing the second stage in the development of legislative measures in the fight against environmental pollution (at the first stage, the quality parameters of the natural environment are formed by law).

СТАЦІЯ – ділянка простору, що характеризується сукупністю умов (рельєф, клімат, їжа, притулок тощо), необхідних для існування даного виду тварин. Характерні для виду С. мозаїчно розподілені в межах видового ареалу, тому ареал ніколи не буває заселений суцільно.

STATION – is an area of space characterized by a set of conditions (relief, climate, food, shelter, etc.) necessary for the existence of a given species of animal.

Characteristic of the S. species, they are distributed in a mosaic pattern within the range of the species, so the range is never completely inhabited.

СТІЙКІСТЬ ЕКОСИСТЕМИ – її здатність до відповіді, пропорційній величині впливу. Нестійкою вважається екосистема, яка реагує на відносно слабкий зовнішній вплив невідповідно значним відкликом.

ECOSYSTEM RESILIENCE – its ability to respond in proportion to the magnitude of the impact. An ecosystem that reacts to a relatively weak external influence with a disproportionately large response is considered unstable.

СТРАТЕГІЯ ЖИТТЯ ПОПУЛЯЦІЙ – способи виживання і підтримки стабільності популяцій видів рослин, тварин в екосистемах. Відповідно до теорії Р. Уітекера (1975) є три типи С. ж. п. за динамікою чисельності між верхніми і нижніми межами їх існування: К-стратеги, L-стратеги і R-стратеги. К-стратеги підтримують чисельність верхньої межі за рахунок диференціювання екологічних ніш, L-стратеги – нижньої межі за рахунок переживання стресів у стані спокою, К-стратеги – чисельність популяції, яка коливається від верхньої до нижньої меж. Близька до неї теорія, розроблена Л.Г. Романським (1938): конкуренти – віоленти; стрестолеранти – патієнти і експлеренти. Більшого поширення одержала емпірична система оцінки стратегії життя, запропонована Д. Граймом (1974) і розвинена Б. М. Міркіним (1985). За цією системою виділяють три основні стратегії: С-стратегія реалізується видами-конкурентами, S-стратегія – стресостійкими і R-стратегія – рудеральними популяціями, а також чотири проміжні.

LIFE STRATEGY OF POPULATIONS – methods of survival and maintaining the stability of populations of plant and animal species in ecosystems. According to the theory of R. Whitaker (1975), there are three types of S. zh. according to the number dynamics between the upper and lower limits of their existence: K-strategists, L-strategists, and R-strategists. K-strategists maintain the number of the upper limit due to the differentiation of ecological niches, L-strategists – the lower limit due to experiencing stress in a state of rest, and K-strategists – the number of the population, which fluctuates from the upper to the lower limits. A theory close to it, developed by L.G. Romanskyi (1938): competitors are violent; stress-tolerant – patients and expletives. The empirical system of life strategy evaluation, proposed by D. Grim (1974) and developed by B. M. Mirkin (1985), became more widespread. According to this system, three main strategies are distinguished: C-strategy is implemented by competing species, S-strategy by stress-resistant, and R-strategy by ruder populations, as well as four intermediate ones.

ТРОФІЧНИЙ ЛАНЦЮГ (ланцюг живлення, ланцюг харчовий) – ряд видів або їх груп, кожна попередня ланка в якому служить їжею для наступного. В межах Т. л. розрізняють травоїдність, паразитизм і хижацтво.

TROPHIC CHAIN (food chain, food chain) – is a series of species or their groups, each previous link which serves as food for the next. Within T. ch. distinguish between herbivory, parasitism, and predation.

ТРОФНІСТЬ – абсолютне і відносне багатство екотипів на поживні речовини, яке визначається характером ґрунтів, гірських порід і відкладень, вмістом розчинних солей, що доступні рослинам. Для встановлення рівня трофності використовують індикаторні рослини (трофоіндикатори).

TROPHICITY – the absolute and relative richness of ecotypes in nutrients, which is determined by the nature of soils, rocks, and sediments, and the content of soluble salts available to plants. To establish the level of trophicity, indicator plants (trophindicators) are used.

УГРУПОВАННЯ – сукупність видів, об'єднаних певними взаєминами між собою, спільною територією і умовами існування. Окреме рослинне угруповання – фітоценоз, тваринне – зооценоз, мікробне – мікробоценоз тощо.

GROUPING – a set of species united by certain relationships with each other, common territory, and conditions of existence. A separate plant group – phytocenosis, animal – zoocenosis, microbial – microbocenosis, etc.

УГРУПОВАННЯ БІОТИЧНЕ (біоценоз) – сукупність популяцій, що живуть на певній території (біотоп) і функціонують як єдине ціле завдяки взаємопов'язаним метаболічним перетворенням і які є живою частиною екосистеми.

BIOTIC GROUPING (biocenosis) – a set of populations living in a certain territory (biotope) and functioning as a whole due to interrelated metabolic transformations and which are a living part of the ecosystem.

ФОНД ЗАПОВІДНИЙ – сукупність всіх природоохоронних територій (заповідників, заказників регіону, країни).

RESERVE FUND – a collection of all nature conservation areas (reserves, regional reserves, country).

ЦІНА ПРИРОДНИХ РЕСУРСІВ – грошове вираження господарчого ефекту від експлуатації природних ресурсів; включає соціальну та екологічну ціну. У світовій економіці поняття «ціна» включає ресурсоємкість, соціальну,

територіальну, екологічну, енергетичну ціни, а фактична ціна включає також поправку на дефіцитність продукту, витрати на відновлення ресурсу та зовнішнього середовища, на утилізацію частки, що вийшла з використання (наприклад, демонтаж АЕС потребує від 1/6 до 1/3 первинних капіталовкладень).

THE PRICE OF NATURAL RESOURCES – a monetary expression of the economic effect of the exploitation of natural resources; includes the social and environmental costs. In the global economy, the concept of "price" includes resource-intensive, social, territorial, environmental, and energy prices, and the actual price also includes corrections for the scarcity of the product, the costs of restoring the resource, and the external environment, for the disposal of the part that has gone out of use (for example, the dismantling of a nuclear power plant requires from 1/6 to 1/3 of initial capital investments).

ЧЕРВОНА КНИГА – список і опис рідкісних і тих, що перебувають під загрозою зникнення тварин, рослин і грибів. У ній наводиться інформація про основні причини вимирання конкретних видів і про шляхи їх порятунку. Міжнародним союзом охорони природи (МСОП) перший том Червоної книги був виданий в 1966 р. У СРСР Червона книга була заснована в 1974 р. Нові видання з уточненими і зміненими списками видів зазвичай виходять через 5–10 років. Види, яким вже не загрожує зникнення внаслідок вжитих заходів виводяться з Червоної книги, а ті, чисельність яких стала катастрофічно зменшуватися – заносяться.

RED BOOK – a list and description of rare and endangered animals, plants, and fungi. It provides information about the main causes of extinction of specific species and ways to save them. The first volume of the Red Book was published by the International Union for Conservation of Nature (IUCN) in 1966. In the USSR, the Red Book was founded in 1974. New editions with updated and changed lists of species are usually published after 5–10 years. Species that are no longer threatened with extinction as a result of the measures taken are removed from the Red Book and those whose numbers have begun to decrease catastrophically are listed.

ЧЕРВОНА КНИГА УКРАЇНИ – основний державний документ, у якому містяться узагальнені відомості про сучасний стан видів тварин і рослин України, що перебувають під загрозою зникнення, та заходи щодо їх збереження та науково обґрунтованого відтворення. Ч.к.У. є основою для розробки подальших дій, спрямованих на охорону занесених до неї видів тварин і рослин. Ч.к.У. – офіційний державний документ, який містить перелік рідкісних і таких, що перебувають під загрозою зникнення, видів тваринного і

рослинного світу у межах території України, її континентального шельфу та виключної (морської) економічної зони, а також узагальнені відомості про сучасний стан цих видів тваринного і рослинного світу та заходи щодо їх збереження і відтворення.

RED BOOK OF UKRAINE – the main state document, which contains generalized information about the current state of endangered species of animals and plants in Ukraine, and measures for their conservation and scientifically based reproduction. R.b.U. is the basis for the development of further actions aimed at the protection of the species of animals and plants included in it. R.b.U. – an official state document that contains a list of rare and endangered species of animal and plant life within the territory of Ukraine, its continental shelf, and exclusive (marine) economic zone, as well as general information about the current state of these animal and plant species flora and measures for their preservation and reproduction.

ШКОДА ОТОЧУЮЧОМУ СЕРЕДОВИЩУ ЕКОЛОГІЧНА – негативні зміни оточуючого середовища, викликані антропогенною діяльністю у результаті впливу на неї, забруднення оточуючого середовища, виснаження природних природних ресурсів, руйнування екосистем, що створюють реальну загрозу для здоров'я людини, рослинного та тваринного світу.

ECOLOGICAL ENVIRONMENTAL DAMAGE – negative changes in the environment caused by anthropogenic activity as a result of an impact on it, pollution of the environment, depletion of natural resources, and destruction of ecosystems, which pose a real threat to human health, flora, and fauna.

ШТРАФ ЗА ПОРУШЕННЯ ПРАВИЛ ПРИРОДОКОРИСТУВАННЯ – грошове відшкодування, що визначається в адміністративному чи в судовому порядку у відповідності з існуючим законодавством; може бути або у твердому вигляді (встановлюється законом або актом) або складати певний процент від нанесеного збитку; може звільнювати чи ні від кримінальної відповідальності; бути одноразовим або відраховуватися від обсягу (часу) забруднення (за годину викиду, одиницю його об'єму). Штрафу також підлягають інші порушення природного середовища, що ведуть до втрати будь-яких ресурсів (промислових, рекреаційних та інших).

Штраф є ефективним в умовах приватного підприємництва у країнах з розвиненою ринковою економікою. Штраф, що знімається з власника, дисциплінує його та примушує до технічного вдосконалення. Головна роль штрафів – спрямування додаткових коштів на відновлення природних ресурсів у місці їх незаконного вилучення або забруднення. У розвинених країнах світу

дієвим є принцип відшкодування збитків “забруднюючий сплачує”.

PENALTY FOR VIOLATION OF NATURE USE RULES – monetary compensation determined administratively or judicially by existing legislation; can be either in a solid form (established by law or an act) or make up a certain percentage of the damage caused; may or may not exempt from criminal liability; be one-time or calculated from the volume (time) of pollution (per hour of emission, unit of its volume). Other violations of the natural environment that lead to the loss of any resources (industrial, recreational, and other) are also subject to a fine.

The fine is effective in the conditions of private entrepreneurship in countries with a developed market economy. The fine, which is removed from the owner, disciplines him and forces him to technical improvement. The main role of fines is to direct additional funds to the restoration of natural resources at the place of their illegal extraction or pollution. In the developed countries of the world, the "polluter pays" compensation principle is effective.

ЮНЕСКО – організація об’єднаних націй з питань, освіти, науки і культури. Міжвладна організація організована в 1946 р. як спеціалізована установа ООН, що допомагає закріпленню миру і безпеки, сприяюча співробітництву народів шляхом розповсюдженню освіти, науки і культури. Випускає декілька десятків періодичних і неперіодичних видань на багатьох мовах, у т.ч. з проблем природокористування і охорони природи журнал «Природа і ресурси». Важливого значення Ю. надає роботі в області збереження природних ресурсів, охорони навколишнього людського середовища. За ініціативою Ю. проводиться низка міжнародних програм: «Людина і біосфера», «Міжнародна гідрологічна програма» і ін.

UNESCO – the United Nations Organization for Education, Science and Culture. The intergovernmental organization was organized in 1946 as a specialized agency of the UN, which helps to establish peace and security and promotes the cooperation of peoples by spreading education, science, and culture. It publishes several dozen periodical and non-periodical publications in many languages, including on the problems of nature management and nature protection magazine "Nature and Resources". U. attaches great importance to the work in the field of conservation of natural resources and protection of the human environment. At U.'s initiative, several international programs are held: "Man and the Biosphere", "International Hydrological Program" and others.

ЯКІСТЬ НАВКОЛИШНЬОГО ПРИРОДНОГО СЕРЕДОВИЩА – сукупність показників, що характеризують стан навколишнього природного середовища.

QUALITY OF THE ENVIRONMENT – a set of indicators characterizing the state of the environment.

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