
ECOLOGICAL BASES OF FORMATION OF THE LAND USE OF THE TERRITORIES OF THE NATURAL RESERVOIR FUND IN THE COMPOSITION OF ECOLOGICAL NETWORK OF UKRAINE

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The article highlights ecological and economic measures on the formation of land use territories of the nature reserve fund within the ecological network of Ukraine, its current state and problems, as well as directions of improvement. These measures are directed towards the balanced provision of the needs of the population and sectors of the economy with land resources, rational use and protection of lands, preservation of landscape and biodiversity, creation of environmentally safe living conditions of the population and economic activity and protection of land from depletion, degradation and pollution.

Key words. Ecological network, landscape, natural reserve fund, sustainable land use, biota.

Formulation of the problem.

At the current level of development of science and technology, human society is a huge consumer of natural resources: not only minerals, but also wildlife. In addition, it uses natural landscapes for recreational and aesthetic purposes. Therefore, preservation and careful attitude to nature becomes the number one challenge for all countries, especially for Ukraine, which has truly great natural wealth. One of the main steps in solving this problem is the formation of natural land use by creating

especially protected natural territories, which not only contribute to the protection and restoration of valuable and unique natural objects and sites, but also to the ecological education of people, which is important. In solving this problem, since the attitude to the nature of each person affects the attitude of the whole of society to it. In connection with all of the foregoing, the ecological principles of land use formation in the territories of the nature reserve fund within the ecological network of Ukraine in the context of the formation of environmental land use is very relevant.

Analysis of recent research and publications.

In Ukraine, a large number of scholars engaged in the study of this problem. First of all, it is a study of such scientists as L.YA. Novakovs'kyy, D.S.Dobryak, I.A. Rozumnyy, A.M. Tretyak, V.M. Tretyak, A.YA.Sokhnych, O.P. Kanash A.D Yurchenko V.O.Leonets and others. However, a number of issues still remain insufficiently highlighted and require further elaboration.

The purpose of the article.

Investigation of ecological bases of formation of land use territories of the nature reserve fund within the ecological network of Ukraine.

Presentation of the main research material.

The process of creating an ecological network at the local level is proposed through the development of land management projects for the development of land use ecosystems of the territories of rural, town and city councils. The first stage in the formation of the land use of the ecological network is the analysis and evaluation of the specifics of land use of the components of the ecological network within the administrative formations in a number of positions. Virtually every administrative entity from the point of view of the natural structure as a unit, one way or another, is artificial. Administrative formations, as a rule, do not coincide with the natural boundaries, therefore neither floral nor blue-dynamic criteria, in spite of their naturalness and unconditional necessity, are not sufficient. Therefore, the formation of land use, especially agricultural

and environmental, must be carried out taking into account landscape criteria. They are crucial for a comprehensive analysis of the natural conditions of administrative formations and take into account both a set of physical and geographical information on land use and data on anthropogenic transformation of their land and other natural resources.

The landscape criteria are closely correlated with the biological ones, which are essential for the selection of land included in the ecological network. Of particular importance is the close connection between the indicators of biodiversity and the characteristics of the spatial structure of the landscape, which refers to the quantitative ratio and spatial distribution of various elements of the landscape. It is desirable to carry out analysis of land use within the administrative-territorial units using cartographic and other materials on land management. This allows to distinguish the landscape elements of different groups according to the degree of landscape changes. Such a network of landscape formations should be considered as the territory of the structural element of the econet of a local scale. Structural elements of the formation of the land use of the ecological network, including the nature reserve fund, are determined by objectively determined natural factors, spatial parameters of ecosystems and other types of territorial entities, in accordance with the principles we have established (Table 1).

Thus, the structural elements of the formation of land use territories of the natural reserve fund as an integral part of the ecological network include: land use of the main territories and objects of the natural reserve fund, land use of the buffer territory, land use of the restored territory. In their unified unity, they form the land use of the ecological

Table 1. Structural elements of the formation of land use territory of the natural reserve fund as part of the ecological network

Structural element of land use of the nature reserve fund	Criteria formation of the land-use of the nature reserve fund	Signs
Land use of the main territories and objects of the nature reserve fund	Concentration of ecosystem and landscape diversity	Nuclear element of the nature reserve fund. Land use conservation of ecosystem and landscape diversity, habitats of organisms (ie, the area of important biological and environmental significance) is well integrated in the landscape
Land use of buffer territory	Support for reproduction, exchange of gene pools, migration, maintaining ecological equilibrium, etc.	Protective element Territories surrounding (partially or completely) territories and objects of the nature reserve fund (core) or ecocorridor and provides their protection against external influences
Land use of restored territory	It is determined depending on what functions the land will perform after re-naturalization	Perspective element. The lands are intended for the restoration of the integrity of functional links in the main territories of the nature reserve fund or buffer territory of land use ecocorridors of the ecological network. These may be land with completely or partially degraded soils and other natural elements, which should be the first priority measures to reproduce the original natural state. In the long run, they may be part of other elements of the econet

network, which functionally combines the biodiversity centers into a single regional and national system.

Structural elements of the formation of the land use of the territory of the natural reserve fund as part of the ecological network: the main territories and objects of the nature reserve fund, buffer and recovery territories, in their unity, and create an ecosystem that functionally combines the biodiversity centers into a single national and continental the system.

The criteria for choosing the land use of the main territories and objects of the nature reserve fund are the territories of the greatest concentration of genetic, species, ecosystem and landscape diversity, as well

as habitats of organisms, that is, areas of important biological and ecological importance, are well integrated in the landscape. Their area may vary depending on the area where natural diversity has survived, the spread of rare species or functional relationships with other natural territories, as well as from the territorial level, but not less than 500 hectares.

Land use of the main territories and objects of the nature reserve fund are the nodal elements of the nature reserve fund and include, first of all, the territory of the largest diversity, where different landscapes or their components occur. These are historically formed intersections of natural ways of biota formation.

According to the value of land use, the main territories and objects of the nature reserve fund can be divided into three groups:

1. Areas that are characterized by the diversity or uniqueness of the biota;
2. Territories on which the natural landscapes with a continental, national or regional value are well preserved;
3. Territories that are man-made landscapes, which have a significant natural and historical and cultural value.

The basic criteria for the selection of land use of the main territories and objects of the nature reserve fund are: the degree of naturalness of the territory and its diversity; the wealth of diversity; level value of variety; rareness of diversity; representation of endemic, relic and rare species; representativeness of diversity; typology of variety; completeness of diversity; optimality of the size and naturalness of the borders; the degree of functional significance of the variety; compliance with the complete landscape structure; the presence of anthropogenically altered areas rich in biodiversity; availability of plants and animals specific to traditional agrocenoses; the possibility of integration into the European ecological network.

The first indicators (the degree of naturalness of the territory and its diversity, the level of wealth of diversity, the level of value of diversity, the diversity of diversity) can be estimated on a five-point scale, ranging from indigenous unchanged bio- and ecosystems and landscapes to semi-natural and anthropogenic systems. Rootstocks are of natural origin and adapted to their unchanging habitat, that is, their species and longline structure does not differ substantially from their inherent habitat. The root system has the highest value. Accordingly, these territories are

rich in diversity, which is determined by the unit area for the territory of the landscape area or biogeographic province. The criterion may be a measure of heterogeneity of the area.

When choosing the land use of the main territories and objects of the nature reserve fund, the general state of the natural vegetation and fauna of the region is taken into account. For such regions as, for example, the Steppe zone, where the natural vegetation cover is almost completely destroyed, each part of the vegetation close to the natural one should be included in the ecological network. It is expedient to choose the land use of the main territories and objects of the nature reserve fund taking into account not only the current state of the biota, but also the possibilities for its restoration in the future. For regions in the territory where the natural vegetation is maintained well and is marked by slight fragmentation, for example, in Polesie, only the most valuable plots should be selected as key territories.

First and foremost, include the territories and objects of the nature reserve fund (natural and biosphere reserves, national natural parks, as well as large reserves and protected areas, regional landscape parks, etc.); plots on which plant groups grow, entered in the Green Book of Ukraine; territories that are places of stay or growth of species of flora and fauna included in the Red Data Book of Ukraine. And also the land of the water fund, wetlands, water protection zones; the land of the forest fund (primarily virgin forests and large array of little changed forests); part of the land of health improvement with their natural resources; other natural territories and objects (areas of steppe vegetation, pasture, hayfields, stone outcrops, sands, salt mines, land plots, within

which there are natural objects of special natural value); partly agricultural land of extensive use - pasture, meadows, hayfields, etc. In special cases, land use of the main territories of the nature reserve fund includes radioactive contaminated land that is not used and is subject to special protection as natural regions with a separate status.

The criteria for choosing the land use of the buffer zone are transitional bands between the natural territories and the territories of economic use. The main function of the land use of the buffer territory is to ensure the protection of the territorial elements of the econet from negative anthropogenic impact. They should have an area sufficient to protect the land use of the main territories and objects of the nature reserve fund from the action of external negative factors and optimize certain forms of management in order to preserve existing and restore the lost natural values. The buffer zone may include buffer zones of natural and biosphere reserves and national natural parks as part of land use; part of the land of the water fund and water protection zones; partly the land of the forest fund; other forested territories, including forest strips and other protective shrubs not belonging to the forest fund lands; recreational land, used for mass recreation of the population and tourism and conducting sporting events; partly agricultural land of extensive use - pasture, meadows, hayfields, etc.

The criteria for selecting the land use of the restored territory are created from the components of the ecological network in order to further develop and improve the functioning of the nature reserve fund. The main criteria for choosing the land use of the restored territory is to preserve their habitats, even if natural biodiversity is completely destroyed

(drained peatlands, degraded meadow and steppe natural pastures, liquefied forests, intensive use of agrocentoses), and the real possibility of carrying out renatural measures. Restoration of ecological connections between natural territories can be carried out both natural and artificial ways - landing of forest, erosion of coastal strips along rivers, etc. The land use areas of the restored territory include land, which must play the function of the relationship of biota with the main territories: it has long been plowed, low-yielding; secondarily salted due to excessive irrigation; pasture failures, livestock breeding areas and its permanent concentration; infested with quarantine species of weeds, including harmful to human health; quarries, bream breeds, etc.; arable land on slopes, which are allocated to soil protection strips, or permanent plots intended for the breeding of wild pollinating insects; slopes of landmarks and stripes of alienation along highways, railways, oil and gas pipelines, transmission lines and other communications; areas of open soil on which occur, or elder and slope processes can develop; permanent recreation areas and other recreational areas; areas subject to long-term preservation due to radiation, chemical or other contamination, which poses a threat to the health of people and animals; residential areas to be rehabilitated - farmsteads, abandoned farms, etc.

The main objective of the formation of the national ecological network is to increase the area of natural territories to the level, on the one hand, sufficient to ensure balanced use and reproduction of biotic resources, and on the other - adequate to ecologically safe economic use of land.

The national ecological network has a multi-faceted role - contributes to the preservation of landscape diversity, to

ensure the stability of biocenoses, and provides natural ways of migrations of certain species of plants and animals. Indirectly, the ecological network provides protection of surface and groundwater, creates favorable conditions for the improvement of the population, positively affects the state of the natural resources of agriculture, fish, forestry, protection of settlements and ways of combinations from natural disasters and man-made disasters, reduces the effect of the greenhouse effect on the climate, increases the production of oxygen by plants, reduces dust pollution and contamination of the surface layer of the atmosphere, creates many other effects, useful in the ecological, economic, social sense [3]. Thus, the national ecological network serves as an integral natural resource for multipurpose purposes. It is important to determine the indicators for assigning certain territories to the ecological network to solve administrative problems. Due to the multi-criteria nature of the ecological network assessment, they can be determined depending on approaches to its definition, such as geosystem, ecological, economic, geoplanet, spatial-functional, land management, etc.

The main goal of the formation of the ecological network of Ukraine is the determination of measures to increase the share of the land fund of the country with natural landscapes sufficient to ensure their diversity, close to the natural state of nature, and the formation of their spatial unified territorial system, structured in accordance with the possibility of natural migration and distribution of plant species and animals. At the same time, the national ecological network must meet the requirements for its functioning in the All-Ukrainian and World Ecological Network [2].

In order to assure the authority of various management bodies regarding the formation of the ecological network, it should be divided into territorial elements of national and local significance. Structural elements of the national econet of national importance carry out strategic functions and include structural elements of two main categories - natural regions, in which the existing and future protected nature reserves of the highest level and the natural corridors that perform communication functions are concentrated.

Determination of parameters of specific boundaries of elements of the National Ecological Network is carried out by drawing up appropriate land management projects based on the following mandatory stages (provisions):

1. The objects of the nature reserve fund (regional landscape parks, nature reserves, natural reserves, nature monuments, national natural parks, preserves, botanical gardens, zoological and dendrological parks, parks of landscape garden art), which should become elements and core nuclei of the National Ecological Network of Ukraine (including objects of the natural reserve fund of local importance).

2. The prospects for the development of the natural reserve fund and the location of objects of nature conservation nature are determined.

3. Establish natural regions and natural corridors for the formation of trans-boundary elements of the National Ecological Network of Ukraine.

4. The natural regions and corridors are defined, which serve as the main elements forming the spatial parameters of the national econet.

5. The boundaries of natural regions and parameters of natural corridors and buffer zones are established.

6. A list of valuable natural objects for which installation is required or a special mode of use (forms of use) has already been established.

7. Areas and placements on cartographic materials in the process of land management are determined:

a) territories and objects of the natural reserve fund;

b) water objects, wetlands, coastal strips, territories near the sources of rivers;

c) forests, forest bands, shrubs;

d) natural forage lands - grasslands, pastures;

e) other natural lands - ravines, sands, stony places, dry open lands with a special vegetation cover;

g) radioactive contaminated land not used in agricultural production;

c) degraded and unproductive arable land located in a crisis and pre-crisis condition.

8. The systematization of the existing modes of using the land of these territories is carried out and the development on the basis of them in the process of land management of restrictions and encumbrances (servitudes) is carried out.

9. The list of zones of special regime of land use is being compiled, description of land use regulations according to authorized uses; as well as by types of restrictions on the use of lands that require special approval, etc. in the land management process.

10. The development of the manipulation and manipulation for recording the allocated areas of territorial environmental restrictions and establishing land management and urban planning regulations, restrictions and encumbrances (including entry in the state register of restrictions and encumbrances) is being developed.

11. Land management operations are carried out to determine or, if necessary, establish in-kind boundaries of land plots of the ecological network components in the form of development and approval of land-use documentation.

12. An ecological and economic assessment of the territories and land plots of the ecological network elements is carried out.

13. The development of a system of economic sanctions for failure to comply with established land management or urban planning regulations and procedures for recovering damages.

14. Data is submitted on the right status and restrictions on the use of lands of certain elements of the ecological network in the state land cadastre.

Conclusions

Design of structural elements of the Ukrainian ecological network at the local level should be carried out in land management projects and include: a) the identification of territories with special environmental, ecological, recreational, historical and cultural value, the establishment of restrictions stipulated by law in the use of land and other natural resources; b) substantiation of the need to include the borders of renewable, buffer and connecting territories and ensure the formation of the ecological network as the only spatial ecological system.

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**ЕКОЛОГІЧНІ ЗАСАДИ ФОРМУВАННЯ
ЗЕМЛЕКОРИСТУВАННЯ ТЕРИТОРІЙ
ПРИРОДНО-ЗАПОВІДНОГО ФОНДУ В
СКЛАДІ ЕКОЛОГІЧНОЇ МЕРЕЖІ УКРАЇНИ**

Висвітлено еколого-економічні заходи щодо формування землекористування територій природно-заповідного фонду в складі екологічної мережі України, його сучасний стан і проблеми, а також напрями вдосконалення. Ці заходи направлені на збалансоване забезпечення потреб населення і галузей економіки земельними ресурсами, раціональне використання та охорону зе-

мель, збереження ландшафтного та біологічного різноманіття, створення екологічно безпечних умов проживання населення й господарської діяльності та захист земель від виснаження, деградації і забруднення.

Ключові слова: екологічна мережа, ландшафт, природно-заповідний фонд, стале землекористування, біоти.

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**ЭКОЛОГИЧЕСКИЕ ОСНОВЫ
ФОРМИРОВАНИЯ ЗЕМЛЕПОЛЬЗОВАНИЯ
ТЕРРИТОРИЙ ПРИРОДНО-ЗАПОВЕДНОГО
ФОНДА В СОСТАВЕ ЭКОЛОГИЧЕСКОЙ
СЕТИ УКРАИНЫ**

Освещены эколого-экономические мероприятия по формированию землепользования территорий природно-заповедного фонда в составе экологической сети Украины, его современное состояние и проблемы, а также направления совершенствования. Эти меры направлены на сбалансированное обеспечение потребностей населения и отраслей экономики земельными ресурсами, рациональное использование и охрану земель, сохранения ландшафтного и биологического разнообразия, создание экологически безопасных условий проживания населения и хозяйственной деятельности и защиту земель от истощения, деградации и загрязнения.

Ключевые слова: экологическая сеть, ландшафт, природно-заповедный фонд, устойчивое землепользование, биоты.