

**THE CURRENT STATE AND STRUCTURE OF THE NATURE RESERVE
FUND OF THE IVANO-FRANKIVSK REGION**

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Abstract. *The current state and structure of the nature reserve fund (NPF) of the Ivano-Frankivsk region after the implementation of the administrative-territorial reform carrying out. To assess the current state and features of the distribution of NRF of the Ivano-Frankivsk region, the number and comparisons of indicators of protection and density of NRF objects in the region carried out.*

The network of natural protected areas in Ivano-Frankivsk region numbered 526 objects with a total area of 2238,52 km², which is 16.1% of the area of the region, which gives it the opportunity to be among the five regions of Ukraine with the highest rate of protected areas. The nature reserve fund of the region consists of 8 categories of objects. The territory of the districts the assessment carried out according to the percentage of protected areas and density. The highest value of the reserve indicator is observed in the Verkhovyna district (63,7%), the least - in the Kolomiya district (0,88%). The density index for the region was 38. The study shows

the great nature reserve potential of the region. It is expedient to use the results of the study of the distribution of NRF lands in the Ivano-Frankivsk region for making management decisions by territorial communities with the aim of creating new, more significant for the protection of objects, or unifying already existing categories of NRF.

Keywords: *nature reserve fund, reserve index, Ivano-Frankivsk region.*

Topicality. The main task of the state in the field of preservation and restoration of the natural environment there is preservation of unique natural complexes by creating nature reserves, national parks, sanctuaries and natural monuments of state and local importance. According to the Law of Ukraine «On the Nature Reserve Fund of Ukraine», «the nature reserve fund is protected as a national property, for which a special regime of protection, reproduction and use is established. Ukraine considers this fund as an integral part of the world system of natural territories and objects under special protection» [1]. All this is designed to preserve biological and landscape diversity, ensure its rational use, prevent degradation, pollution, damage, depletion, destruction and other harmful effects. The highest safety of ecosystems is provided by nature reserves, because on the territory completely are withdrawn from economic turnover natural complexes, typical and rare landscapes.

In order to establish the regularities of the distribution of NRF objects, they conduct an assessment of their spatial distribution within administrative and territorial units, determine the quantitative and qualitative characteristics of nature protection objects and territories. The obtained results can be used for further management decisions for the purpose of reserving and expanding the lands of the NRF.

Analysis of recent researches and publications. The question of the analysis of lands of the nature reserve fund of the Ivano-Frankivsk region is dedicated is a whole series of works by many scientists. Most of the works of domestic specialists are focused on the location and representativeness of NRF objects.

In the work of O. Sukhorska and O. Matsuska [2] a comparative assessment of the structure of the nature reserve fund of the Ivano-Frankivsk region before the implementation of the administrative-territorial reform was carried out and suggested ways to preserve and expand the territory of the NRF of the region

The study of the network of territories and objects of the nature reserve fund of the Ivano-Frankivsk region is presented in the work of O. Levytskyi [3]. The work also considers the issue of peculiarities and reasons for territorial placement in the region. Special attention is paid to the issue of recreational services in the nature-reserved territories of the region under the conditions of tireless use of natural resources and preservation of biodiversity.

In their research [4] E. Klivets and M. Romanchuk conducted the distribution of territories and objects of the nature reserve fund of the Ivano-Frankivsk region according to their importance, categories and types. It was noted that «the highest density of NRF in Ivano-Frankivsk region is located in Horodenkivskiyi, Nadvirnyanskyi, Kosivskyi districts and equals or exceeds the average value for the region».

L. Petrova in his work [5] conducted an analysis of the structure of the network of protected objects in the western part of Ukraine in terms of physical and geographical areas of the studied region and established its landscape-geographic representativeness, noting, that noting that to increase the effectiveness of the regional network of forest protected objects, it is necessary to develop the network in the direction of improving representativeness. L. Petrova considers it expedient to increase the rate of protection of natural landscapes of the western part of Ukraine and to level significant disparities in the territories where the protected regime has been established.

In the work of M. Palinchak and co-authors [6] it is considered the evolutionary stages and peculiarities of the formation of nature-reserved territories of Transcarpathia are considered. Special attention is paid to nature reserves and national natural parks of the Ukrainian Carpathians. It has been scientifically proven that the most effective means of their preservation is the creation on their basis of

cross-border natural reserves, which in the future will contribute to the improvement of cross-border cooperation, primarily with neighboring countries, which are members of the European Union.

The work of S. Popovych [7] is devoted to the characteristics of the general state, the establishment of quantitative and qualitative indicators of the PZF network, and the determination of the percentage of the protected area of the Ukrainian Carpathians. In his work, he investigated the history of the formation of the Ukrainian Carpathians, identified their categorical and territorial features, and also clarified the current state of the PZF network.

The purpose of the research is to determine the features of the current state of distribution of the objects of the nature reserve fund of the Ivano-Frankivsk region of the nature reserve fund of Ivano-Frankivsk region by calculating and comparing the indicators of the reserve, density and concentration of NRF objects after the implementation of the administrative and territorial reform in the region.

Materials and methods. To install features of the territorial distribution of categories of objects of the nature reserve fund of the Ivano-Frankivsk region after the administrative and territorial reform data from the source were used <https://pzf.land.kiev.ua/> [8] and data from the open data portal <https://data.gov.ua/dataset/> [9]. In addition, during the research we used statistical processing methods, methods of generalization, systematization, typology classification, grouping, comparative geographical and analytical method. The level of protection was calculated by us as the ratio of the area of the territory under the objects of the nature reserve fund to the area of the district [10]. The indicator of the density of NRF objects was calculated by us as the ratio of the total number of nature reserve objects to the total area of a certain territory [11, p. 275].

Research results and their discussion. Ivano-Frankivsk region is located in the western part of Ukraine in the middle latitudes and temperate climate zone. «The area of Ivano-Frankivsk region is 13,9 thousand km², or 2,3% of the territory of the whole of Ukraine. According to this indicator, it ranks 21st among the regions of the country» [12, p. 7].

A feature of the Ivano-Frankivsk Oblast PZF is that more than half of the protected objects are concentrated in the mountainous part, a quarter in the foothills, and only a tenth in the plains.

One of the main directions of protected areas in the region is the preservation of existing and the creation of new protected areas. As of January 1, 2022, the area of the nature reserve fund of the region is 223,852 thousand hectares or 16,1% of the area of the region and includes 526 territories and objects, of them, 33 are objects of national importance (131,6 thousand ha) and 493 objects of local importance (92,227 thousand ha) [12, p. 90].

Based on the data [11] the ratio of the area of individual categories to the total area of the NRF of the region was calculated. Thus, more than half (53,8%) of the area of the NRF of the region is occupied by national natural parks, half as much by protected areas (21,4%), on the share of regional landscape parks – 17,2%. The smallest share (1,1%) falls on parks-monuments of horticultural art and dendrological parks.

The area of the territory under objects of national importance is 58,8% of the total area of the NRF of the region. Among them is one nature reserve («Gorgany»), 5 national nature parks («Verkhovynskyi», «Hutsulshchyna», «Halytskyi», «Karpatskyi» and «Synihora»), 3 dendrological parks, 10 sanctuaries, 13 natural monuments and 1 park-monument of horticultural art (Park of Partisan Glory «Zarechye»). Among the NRF objects of the region, the largest number of protected tracts are represented (196 objects - all of local importance) and natural monuments (238 objects).

For further analysis of the distribution of NRF objects in the Ivano-Frankivsk region in the regional section after the administrative-territorial reform, the indicator of conservation, density and territorial concentration index was calculated. Before the administrative-territorial reform, there were 14 districts in the region, today there are 6 of them: Verkhovynskyi, Ivano-Frankivsk, Kalusky, Kolomiyskyi, Kosivskyi and Nadvirnyanskyi.

Results of comparative analysis of quantitative indicators of the territory and NRF objects of the region for the six formed districts are presented in the table.1. We can clearly see that Kaluska (154 objects) and Nadvirnyansk (182 objects) districts have the largest number of NRF objects, and the largest areas under NRF objects are located in Verkhovinsk (810,64 km²) and Ivano-Frankivsk (693,94 km²) districts.

The highest value of the reserve indicator is observed in the Verkhovyna district (63,7%), which is explained, first of all, by the location on the territory of the «Verkhovyna» and «Karpaty» national parks, which occupy about 87% of the total area of the district's NRF. The lowest value of the reserve indicator is observed in the Kolomyia district (0,88%), which is connected, first of all, with the category of objects located on the territory of the district – about 60% of the territory of the NRF is occupied by protected tracts and sanctuaries in equal parts. On average, the rate of protection in the region is 16 percent (table 1).

1. Quantitative indicators of territories and objects of the nature reserve fund of Ivano-Frankivsk region by administrative districts (as of 01.01.2022)

Administrative regions	District area, km ²	NRF objects		Reserve index, %	Density index, units/km ²	Index of territorial concentration
		Number	Area, km ²			
Verkhovynskyi	1271,7	41	810,64	63,744	0,032	3,972
Ivano-Frankivsk	3913,1	62	693,94	17,734	0,016	1,105
Kalusky	3555,0	154	272,73	7,672	0,043	0,478
Kolomiyskyi	2484,5	63	21,82	0,878	0,025	0,055
Kosivskyi	853,7	24	273,32	32,016	0,028	1,995
Nadvirnyanskyi	1872,0	182	166,07	8,871	0,097	0,553
Together	13950	526	2238,52	16,047	0,038	-

According to the reserve index, the districts of the region are grouped into five groups: with critically low (less than 1%), low (2-10%), medium (11-20%), high (21-40%) and very high (more than 50 %) levels (Fig.1).

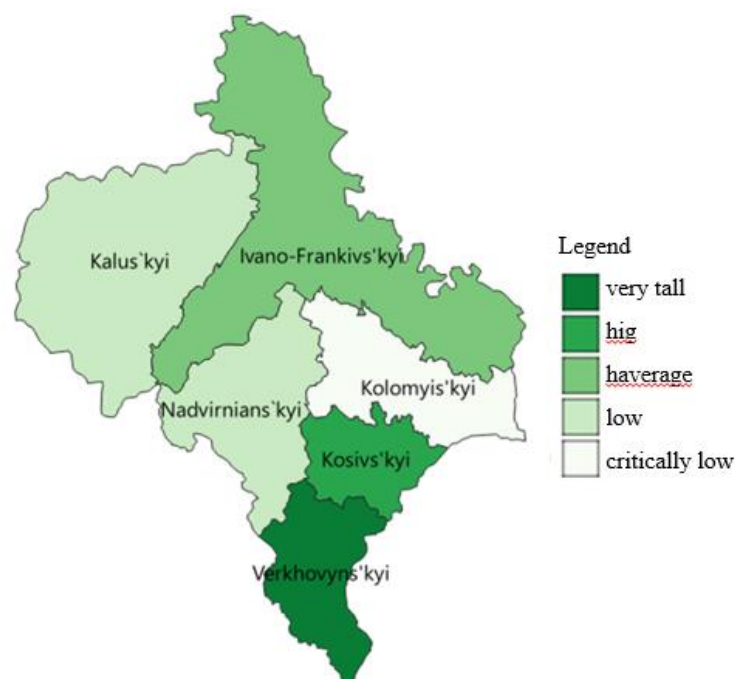


Fig. 1. Territorial distribution of the percentage of preservation of NRF objects of the Ivano-Frankivsk region (as of 01.01.2022)

Along with the absolute values of the number of NRF objects, we also used relative indicators for the analysis, which were calculated relative to an area of 1000 km² (Table 1). The average density of nature protection objects in the region is 38 units/1000 km². The largest relative number of NRF objects is observed in Nadvirnyan district (97 units/1000 km²) due to the largest number of NRF objects and the small area of the district.

The smallest relative number of NRF objects is observed in Ivano-Frankivsk district (16 units/1000 km²) due to the small number of NRF objects in relation to the significant area of the district. The calculation results were grouped into four groups: low (0-20 units/1000 km²), medium (21-30 units/1000 km²), high (31-50 units/1000 km²) and very high (51- 100 units/1000 km²) by density level (Fig. 2).

Discussion. The article examines the current state and structure of the nature reserve fund of the Ivano-Frankivsk region after the implementation of the administrative-territorial reform. In order to assess the current state and features of the distribution of NRF objects in the Ivano-Frankivsk region, calculations and

comparisons of indicators of preservation and density of NRF objects in the region were carried out.

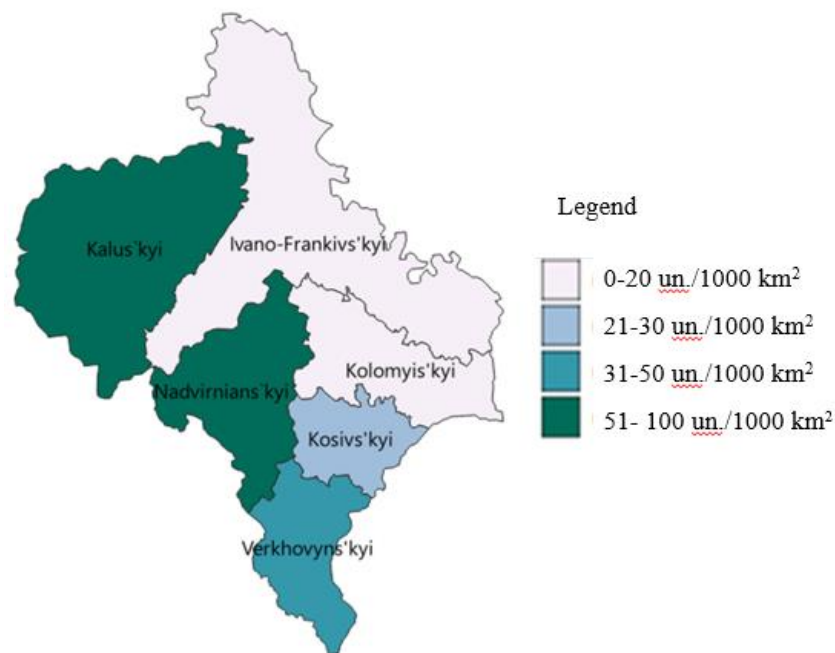


Fig. 2. Density of NRF objects of Ivano-Frankivsk region (as of 01.01.2022)

The analysis of the conservation indicators of the newly created 6 districts shows that the NRF objects of the Ivano-Frankivsk region are unevenly distributed. The largest number of NRF objects is located in the Kaluska and Nadvirnyan districts, and the largest in terms of the area of NRF objects are the Verkhovyna and Ivano-Frankivsk districts.

Verkhovynska district has the highest nature reserve potential (the highest rate of reserve - 63.7%, the largest area of NRF objects - 810.6 km²). The smallest is Kolomyysk district (the smallest protected area – 0.88%, the smallest area of NRF objects – 21.8 km²). On average, the protection index in the region is 16.1 percent.

The average density of nature protection objects in the region is 38 units/1000 km². The largest relative number of NRF objects is observed in Nadvirnyanskyi district (97 units/1000 km²), the smallest - in Nadvirnyanskyi.

The conducted research indicates a large, albeit uneven, composition of the NRF of the region in the section of the newly created districts. Therefore, the main trends in the development of the NRF in the Ivano-Frankivsk region at the current stage are

the creation of objects on significant areas (with the aim of including a greater number of ecosystems), the unification of densely located objects into larger territories in accordance with the concept of a regional eco-network and increasing the indicator reserves in the region, new districts as an indicator of the state of nature conservation in the context of ensuring the balanced development of the region.

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СУЧАСНИЙ СТАН ТА СТРУКТУРА ПРИРОДНО-ЗАПОВІДНОГО ФОНДУ ІВАНО-ФРАНКІВСЬКОЇ ОБЛАСТІ

Анотація. У статті розглянуто сучасний стан і структура природно-заповідного фонду (далі - ПЗФ) Івано-Франківської області після здійснення адміністративно-територіальної реформи. Для оцінки сучасного стану та

особливостей розподілу об'єктів ПЗФ Івано-Франківської області проведено розрахунки і порівняння показників заповідності та щільності об'єктів ПЗФ в розрізі області. Мережа природно-заповідних територій Івано-Франківщині складається із 526 об'єктів загальною площею 2238,52 км², що становить 16,1% площі області, що дає їй можливість входити до п'ятірки областей України з найвищим показником заповідності. Природно-заповідний фонд області складається з восьми категорій об'єктів. Проведена оцінка території районів за відсотком заповідності та щільності об'єктів ПЗФ області. Найбільше значення показника заповідності спостерігається в Верховинському районі (63,7 %), найменше - в Коломийському районі (0,88 %).

Середня щільність природоохоронних об'єктів по області становить 38 од./1000 км². Найбільша відносна кількість об'єктів ПЗФ спостерігається у Надвірнянському районі (97 од./1000 км²) за рахунок найбільшої кількості об'єктів ПЗФ та незначної площі району. Найменша - в Івано-Франківському районі (16 од./1000 км²) унаслідок невеликої кількості об'єктів ПЗФ по відношенню до значної площі району. Результати дослідження розподілу земель ПЗФ Івано-Франківської області доцільно використати для прийняття управлінських рішень територіальними громадами з метою створення нових, більш значущих для охорони об'єктів, або об'єднання вже існуючих категорій ПЗФ.

Ключові слова: природно-заповідний фонд, показник заповідності, Івано-Франківська область.