

GeoTerrace-2023-090**Analysis of the natural recreation resources of the National Nature Park «Male Polysya» using GIS technologies**

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SUMMARY

Among the areas of recreational activity, ecological tourism is gaining more and more popularity every year - recreation in unchanged or little-changed natural territories, which is combined with a positive attitude towards the environment, and not just its use. At the same time, the main centers of recreation and ecotourism in Ukraine are National Natural Parks – objects of the nature reserve fund, one of the tasks of which is to create conditions for organized recreation of the population in natural conditions (The Law of Ukraine, 1992). This is done through a certain organization of the territory, which allows to preserve the most valuable parts of nature, and in the zones where recreational activities are carried out, to control the impact of visitors on the environment and to develop measures to restore disturbed ecosystems. This is a particularly urgent task in the context of the loss and stay under occupation of a significant part of the institutions of the nature reserve fund of Ukraine, in connection with the military aggression of the Russian Federation, as well as significant recreational pressure on the protected territories of the Carpathian region, which necessitates the search for new places for the restoration of physical and mental health of both local residents and internally displaced persons, military personnel, etc. Not the last role in such studies is played by the use of GIS technology.

Keywords: National Natural Park, attractiveness factor, natural recreational resources, GIS technologies, ecotourism

Introduction

Among the areas of recreational activity, ecological tourism is gaining more and more popularity every year - recreation in unchanged or little-changed natural territories, which is combined with a positive attitude towards the environment, and not just its use. At the same time, the main centers of recreation and ecotourism in Ukraine are National Natural Parks – objects of the nature reserve fund, one of the tasks of which is to create conditions for organized recreation of the population in natural conditions (The Law of Ukraine, 1992). This is done through a certain organization of the territory, which allows to preserve the most valuable parts of nature, and in the zones where recreational activities are carried out, to control the impact of visitors on the environment and to develop measures to restore disturbed ecosystems. This is a particularly urgent task in the context of the loss and stay under occupation of a significant part of the institutions of the nature reserve fund of Ukraine, in connection with the military aggression of the Russian Federation, as well as significant recreational pressure on the protected territories of the Carpathian region, which necessitates the search for new places for the restoration of physical and mental health of both local residents and internally displaced persons, military personnel, etc. Not the last role in such studies is played by the use of GIS technology.

Method and Theory

The purpose of our research is to assess the attractiveness of the natural recreational resources of the «Male Polissya» National Nature Park using GIS technologies. We assessed the tourist attractiveness of the territory in accordance with the methodology for assessing natural recreational and tourist resources (RTR) (Ivanunik & Yavkin, 2012).

Results

The National Nature Park «Male Polissya» was created in 2013 with the aim of preserving valuable natural complexes and historical and cultural objects of the eastern part of «Male Polissya», which have an important environmental, scientific, aesthetic, recreational and health significance. The territory of the National Natural Park includes 8762,7 hectares of state-owned land, of which 2764,0 hectares are provided for permanent use, 5998,7 hectares are included in its composition without withdrawal (Decree of the President of Ukraine, 2013). The park is located within the borders of Shepetivka district (formerly Izyaslavskiyi and Slavutskiyi districts) of Khmelnytskyi region, in its northern part, near the relatively large settlements of Shepetivka, Slavuta and Netishyn of Khmelnytskyi region and Ostrog city of Rivne region (The project of organization of the territory, 2020).

The protected zone of the National Natural Park occupies an area of 676,3 hectares or 7,7 % and includes the most valuable territories. The zone of regulated recreation is allocated on the area of 2541,8 hectares, which is 29 % of the total area. The zone of stationary recreation is distinguished within the areas where the development of the infrastructure of long-term recreation facilities is planned. Its total area is 6,3 hectares or 0,1 % of the area. The economic zone is located on an area of 5538,3 hectares, which is 63,2 % of the area of the National Natural Park (The project of organization of the territory, 2020). The above data sets were obtained (generated) on the Google Earth Engine (GEE) platform using the Google Dynamic World (DW) product (Figure 1).

The development of tourism in the «Male Polissya» National Nature Park is in its infancy. Here, 1 ecological trail has been laid in the recreation area of Blue Lakes – «Pearl of Slavutchyna», stationary recreation areas have been organized on the shore of Lake Svyaté and near artificial reservoirs in the hydrological reserve «Blue Lakes» (The official site, <http://malepolisja.in.ua>). One of the most important tasks of the functioning of the National Natural Park «Male Polissya» today is the development of measures for the development of recreation, for which it is necessary to carry out a comprehensive assessment of the recreational potential of its territory (Figure 2).



Figure 1. National Natural Park «Male Polissya» (Google Dynamic World)



Figure 2. Ecological trail in the recreation area of Blue Lakes – «Pearl of Slavutchyna» of the National Natural Park «Male Polissya» (Google Earth)

As a result of the analysis of design and scientific materials, we give a description of the natural recreational resources of the National Natural Park «Male Polissya». The vegetation of the park is dominated by forest vegetation – forest areas covered with forest vegetation make up 89,9 % of the total area of the park. The main forest users of the territory of the «Male Polissya» National Nature Park are the branch «Slavutske Forestry» of the state specialized economic enterprise «Forests of Ukraine» (formerly a state-owned enterprise «Slavutske Forestry») and the branch «Izyaslav Forestry» of the state specialized economic enterprise «Forests of Ukraine» (formerly a state-owned enterprise «Izyaslav forestry»). The territory of the «Male Polissya» National Nature Park is mostly covered with pine and oak-pine forests, swamps and meadows. Low soil fertility and wetlands limited the anthropogenic impact on the territory's vegetation and contributed to its preservation (The project of organization of the territory, 2020).

The Rotten Horn River flows through the territory of the «Male Polissya» National Nature Park with few tributaries and a straight channel in the lower reaches. Before the construction of the Khmelnytskyi nuclear power plant and the Netishyn reservoir, the river was the right tributary of the Viliya River. Now the river flows into a cooling pond, which is connected to Vilia by the remains of the channel and to Horynya by several artificial channels. The length of the Rotten Horn River is 28 km, the catchment area is 201 km². The river is winding, straightened at the bottom, 8–12 m wide (The project of organization of the territory, 2020). The river flows directly through the territory of the National Natural Park for a distance of about 2,5 km. Other rivers (Horyn, Viliya) are outside the protected area. River Gnyliy Rog, due to the waterlogging of the riverbed and its flow among the inaccessible and cluttered areas, is not suitable for recreational activities on it.

Lakes are mainly concentrated in the eastern part of the Park - Holy, Blue lakes, lakes of the botanical reserve of national importance «Terebizhi». Saint Lake is the largest lake in Khmelnytskyi region. It is located in the south of Slavutsky district, 17 km from the city of Izyaslav. This is a reservoir of natural

origin. The lake lies in the basin of the Horyn river. The lake is famous for its picturesqueness and crystal clear water. The area of the lake is 8,2 hectares. There is an island in the center of the lake, and a forest surrounds the lake. The lake is fed by artesian springs that rise from the bottom. Since 1970, the Holy Lake has been declared a hydrological natural monument of local significance, and also has the status of a hydrological natural monument of national significance. The Holy Lake forms sphagnum flocs, characteristic only for swamps of northern latitudes. The Blue Lakes are reservoirs of anthropogenic origin, located 11 km northwest of the city of Slavut. Includes a cascade of five reservoirs. Lakes were formed on the site of exhausted sand quarries. The largest of them near the village of Strygany is part of the hydrological reserve of local importance with the same name «Blue Lake». The lakes of the Terebizhi reserve are represented by a group of four lakes, manes located between them and pine forests adjacent to the reservoirs. The territory of the hydrological reserve is a former valley of glacial water runoff. All reservoirs are at different stages of eutrophication and have turned into marshes of various types. The area of the reserve is 30,3 hectares. In total, 72,5 hectares of the territory of the National Natural Park is under water bodies, which is 0,8 % (The project of organization of the territory, 2020).

The territory of the National Nature Park «Male Polissya» is located within the geomorphological formation of the Male Polissya denudation plain. Orographically, the surface of the National Nature Park «Male Polissya» compared to the adjacent heights is leveled, slightly dissected, and lowered. Relative heights range from 15 to 25 m, absolute heights are 200 to 240 meters above sea level. The highest is the central part of the park territory, represented by absolute heights from 218 to 245 m. Absolute heights decrease in the direction to the north (Barshchevskii et al., 2007).

The climate of the territory of the National Natural Park «Male Polissya» is characterized by moderate continentality and significant humidity (Lipinsky, Dyachuk & Babichenko, 2003). Assessment of bioclimatic resources is important for the development of tourism and recreation within the National Natural Park. As a result of the analysis of meteorological indicators on the territory of the National Park, it was determined that comfortable and sub-comfortable periods for rest and recreational activities amount to 243 days a year.

Although the entire territory of the National Natural Park belongs to the nature reserve fund, we evaluate only the territory of protected objects that existed before the creation of the park and were fully included in the zones of protected, regulated and stationary recreation. The rest of the territory is an economic zone, which, although it can be used for the purpose of recreation, constitutes a territory without the exclusion of other land users, which makes it difficult for the development of recreation. The total area of the objects of the nature reserve fund, which are part of the park, is 2255,49 hectares (25,7 % of the territory) (The project of organization of the territory, 2020). Based on the results of the analysis of the natural recreational resources described above, in accordance with the specified methodology (Ivanunik & Yavkin, 2012), we give an assessment of the attractiveness of these recreational resources for the National Natural Park «Male Polissya» using the cartographic basis of Google Earth (Figure 3).

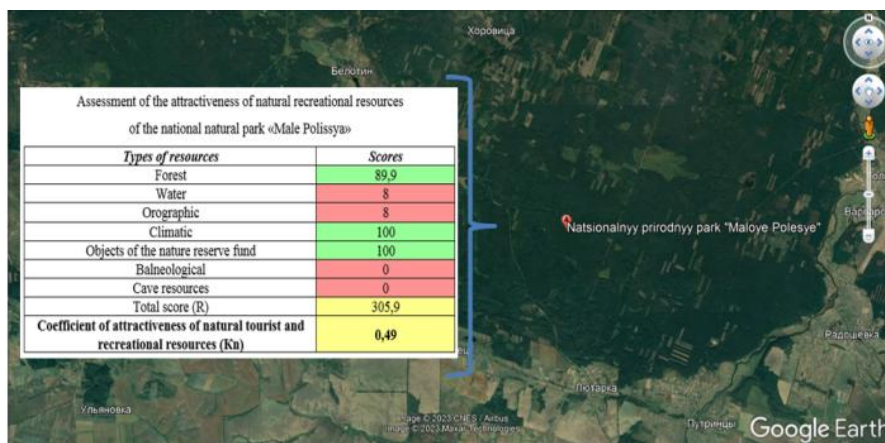


Figure 3. Assessment of the attractiveness of natural recreational resources of the National Natural Park «Male Polissya» (Google Earth)

Conclusions

According to the assessment, the coefficient of attractiveness of the natural recreational resources of the National Natural Park «Male Polissya» is 0,49. Thus, the territory of the park is characterized by the average attractiveness of natural recreational resources.

Therefore, the National Natural Park «Male Polissya» has a significant potential and favorable natural conditions for recreational activities, namely: a high rate of afforestation, a certain number of natural and artificial water bodies. Bioclimatic resources of the park create positive conditions for the development and conduct of recreational activities in warm and cold periods of the year. This should give an impetus to the development of cognitive, medical and recreational and sports and recreational tourism in the relevant zones of the «Male Polissya» National Nature Park.

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