

LANDSCAPE BASIS FOR TOURISM DEVELOPMENT IN POKUTSK CARPATHIANS (UKRAINIAN CARPATHIANS)

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Abstract: The favorable conditions of natural conditions (geological structure, relief, climate, water, soil and floral covering) of the Pokutsk Carpathians - one of the most diverse natural and economic regions of the Ukrainian Carpathians, for the development of tourism have been analyzed. The spatial distribution of attraction natural, including nature protection, territories and objects is revealed. Landscape terrain assessment is based on the degree of favorable tourism and recreational use.

Key words: landscape complexes, tourism, Pokutsk Carpathians, Ukrainian Carpathians.

Introduction

The Pokutsk Carpathians are part of the Ukrainian Carpathians, which is located between the Prut river and its right-back tributary Cheremosh, within the Kosiv and partly Verkhovyna districts of Ivano-Frankivsk region. This is a natural-economic region within the mountainous part of the ethnographic region of Pokuttia. From the point of view of physico-geographical zoning, the Pokutsk Carpathians include the northwestern part of the Low-mountainous Pokutsk-Bukovynian Carpathians of the Low-mountainous Skebian region and the northwestern part of the district of the mid-mountainous Pokutsk-Bukovynian Carpathians of the Middle-Skebian Region (Gostiuk, et al. 2017, Melnyk, 1999). Due to the large variety of natural conditions and good transport accessibility the Pokutsk Carpathians in recent years has become an important tourist and recreational region of the Ukrainian Carpathians.

The aim of our study was to analyze the natural conditions of the region researched. The ultimate goal was to assess the degree of favorability of the landscape complexes for recreational and tourist activities.

Area descriptions, methods and material studied

Initial materials for the analysis of spatial differentiation of landscape prerequisites for the development of re-culture and tourism in the Pokutsk Carpathians served as a landscape map of the researched region concluded by us according to the G.P. Miller's (1974) technique of field landscaping of mountain territories on the scale of research 1: 50 000 (Gostiuk, et al. 2017), topographical, geological and geomorphological maps 1:50 000 (Vashchenko, 19684), tourist map of the Pokutsk Carpathians 1:50 000 (Hutyriak, 2016), tourist map of Kosiv district 1:80 000 (Brusak, et al. 2017), Google Earth images of 5x5 meters resolution and data from their own field trip research and expeditions. The stock materials of the national natural park "Hutsulshchyna" and

the literary sources (Brusak V., et al. 2008, Brusak V., et al. 2011, Gostiuk, 2016, Gostiuk, 2018, Prorochuk, 2004, Prorochuk, 2013, Stefurak, 2018) were used as well.

All materials were processed in the ArcGIS 10.0 software environment, which resulted in the creation of digital database containing information on the landscape structure of the territory, nature protection objects of the Pokutsk Carpathians and little-known objects that are valuable in scientific, cognitive, environmental and recreational significance. On the basis of this, an analysis of the favorable landscape conditions for tourism was conducted.

Results

The natural conditions of the Pokutsk Carpathians are characterized by considerable diversity, due to the peculiarities of geological structure and relief, temperate continental climate, and, consequently, rich biological and landscape diversity. The region is well-accessible in terms of transport - in the central part it is crossed by road with asphalt covering, which connects Kosiv and Verkhovyna, a number of roads are laid down to picturesque villages located in mountain valleys. The Pokutsk lowlands are characterized by dispersed rural buildings, which is timed to the convex ridges of not too high chains and chain slopes, and steeply sloping river valleys are often occupied by beech and spruce forests. For the Pokutsk middle lands there is a predominance of forest vegetation (mainly spruce forests), the chain ridges are occupied by after-forest meadows (mountain valleys), and a few villages are confined to the bottom of the river valleys. All this creates favorable conditions for the tourism and recreation development.

According to the tectonic zoning, the study area belongs to the Inner Zone (Pokutsk covering) of the Precarpathian leading bend and the Skybian Carpathians zone, which are structural parts of the Carpathian fold region (Kravchuk, 2005). From the geomorphological point of view, the Pokutsk Carpathians belong to the sub-region of the Pokutsk-Bukovynian Carpathians, two districts - the low-hill terrain region of the Pokutsk-Bukovynian Carpathians and the region of the mid-hill terrain of Skybian Pokutsk-Bukovynian Carpathians; two sub-districts - Pokutsk low-hill terrain (timed to Pokutsk) and Pokutsk middle-hill terrain (timed to the Skybian covering) (Kravchuk, 2005).

The folded structure of Pokutsk covering is represented by the Kamenist, Karmatury, Brusnyi, Ploskyi, Maksymets folds (Herenchuk, 1973, Liashchuk, 1963). Accordingly, the Pokutsk Lowlands are a system of predominantly symmetric anticlinal chains with broad ridges, steep and downward slopes, separated by syncline depressions. The chains are composed mainly of sandstone flushes of the Cretaceous-Pleogenic age, the sandstone-argillite valleys and Paleogene argillite flyers. The ridges form several low-hill mountain chains with prevailing altitudes of 700-800 m. From the Carpathians edge the Lebedin-Kamianystyi, Karmatura-Khominskyi, Brusnyi-Sokilskyi, Ploskyi-Glynystyj, Maksymetskyi (Herenchuk, 1973, Liashchuk, 1963) ridges are extending in parallel.

The Lebedyna-Kamianystyi ridge on the border with the Precarpathian hill forms a well-defined orographic ledge in height from 250 to 350 m. The absolute height of the ridge varies within 600-800 m (Mykhalkiv 812.4 m). The depth of the mountains absolute heights gradually increases (Bukovets Ritskyi hill, 1059 m - the maximum height of Pokutsk low-hill terrain). The transversal valleys of the Pistynkyi, Ribnitsa, Cheremosh are deep-cut and divide the ridges into separate segments (Herenchuk, 1973, Kravchuk, 2005, Liashchuk, 1963, Prorochuk, 2013).

The Pokutsk middle lands are confined to the Orevskaya Skyba and the Parashksa Skybian Carpathians and are composed mainly of sandstone flushes of Cretaceous age. It is northeast bordering the Pokutsk lowlands, and in the southwest from Vorokhta-Putyla lowland region of the Vododilno-Verkhovynian Carpathians. The area is characterized by a well-defined asymmetry of the mountain chains, a significant vertical and horizontal dismemberment, the predominance of narrow and deep river valleys, the presence of large-sized drainage basins in the upper reaches, the prevalence of narrow ridges in some places with rocky crests and slopes. The mountain chain is connected with the Orivskaya Skyba, with the Gregot peaks (1,472 m), Black Grun (1387.5 m), Kopilash (1155.5 m), Pysanyi Kamin (1221.4 m), and with the Parashki Skyba – the chain of the Rotilo peaks (1483.2 m - the highest peak of the Pokutsk-Bukovynian Carpathians), the Gaborian (1444.5 m), Bila Kobyla (1476.9 m), Variatin (1038.5 m), Synytsia (1185.6 m), Lesnichka (1118.6 m) (Kravchuk, 2005, Tsys, 1956).

On the Pokutsk Carpathians territory there are a number of interesting geological objects that have been granted the status of nature monuments. In addition to the geological monuments of nature, in the low mountains of the Pokutsk Carpathians, there are stone complexes on the separate ridges that are scientific, cognitive, sports, megalithic and aesthetic value. The largest of them are the stone complexes on the Sokilskyi chain, Ternoshora hill, the Dovbush Stone in Zavoyela, Pysanyi Kamin hill. In the middle mountains, some of the highest peaks are covered with stone splinters (scum), which are the main tourist and recreational facilities. These are, in particular, stone placards on Igrets chain, Gregit and Rotylo hills and others.

From the tops of the mountain ranges, there are picturesque landscapes on the surrounding ridges and settlements. Almost from all the highest ridges and tops of the Pokutsk Carpathians you can see the highest in the Ukrainian Carpathians, the Chornohora Range (from the highest peak of Ukraine, Hoverla hill to the famous mysterious Pip-Ivan Chornohirskyi hill). From the edge of low mountain ranges in good weather, the pre-Carpathian villages and the towns of Kolomyia and Sniatyn are perfectly visible. The Pokutsk Carpathian relief is favorable for the pedestrian and cycling tourism development. Mountain ridges have small absolute altitudes that can be easily overcome. Taking into account the territory geomorphological conditions and the local residents' way of life, equestrian tourism is becoming more and more successful.

The Pokutsk Carpathians' climate, as already mentioned, is moderately continental, with non-lethal summer and mild winters (Prorochuk, 2013). The average annual air temperature varies within $+7,0 - +9,0^{\circ}\text{C}$, the average July temperature in the lowland is $+18,2$, in the middle mountains $+15,80\text{C}$, and in January $-3,6$ and $-4,80\text{C}$, respectively (Prorochuk, 2013, Stefurak, 2018). The annual rainfall varies from 470 to 1500 mm, and the average annual precipitation is 800-900 mm) (Prorochuk, 2013). The annual number of days with precipitation is on average 144 days, including 17 days with thunderstorms, 16 - with showers and at least two degrees per year falls (Prorochuk, 2013, Stefurak, 2018). Most of the precipitation occurs in the warm period (March-November) - 73-87 % (Prorochuk, 2013, Stefurak, 2018, Prorochuk, 2013). A permanent snow cover is in the second half of January, and melting at the end of March (Prorochuk, 2013, Stefurak, 2018). Sustained snow covering and the presence of several lifts (Kosiv, Yavoriv village, Sheshory) are the basis for the development of winter recreation - skiing, snowboarding, sledging. Northwest and western winds predominate throughout the entire territory.

A significant amount of precipitation contributes to the formation of a densely riverside network in the Pokutsk Carpathians. The rivers of the studied area belong to the Prut basin. The largest of them are the Black Cheremosh, Berezhnytsia and Iltsia rivers, which have a longitudinal stretch, while the Luchka, Pistinka, Rybnytsia, Cheremosh rivers cross the Pokutsk lowlands (Herenchuk, 1973, Kravchuk, 2005, Prorochuk, 2013).

The rivers of the Pokutsk Carpathians have gorge-like valleys with waterfalls and rivers in the channels. The largest waterfalls are the famous Sheshory waterfalls on the Pistynka river and Kosivsky Gukki on the Rybnytsia river. The Lebedyn lake is known from the lakes in the low mountains of the Pokutsk Carpathians on the Karmatura ridge. There are also many sources of pure mountain water on the territory.

At the foot of the Pokutsk Carpathians, but within the Precarpathian Hills, there are mineral salt and hydrogen sulfide springs - the Krinchist well, the Pistyn salt well and the salt springs in Liucha village.

Water objects are actively used for recreation and tourism. The slope, the flow velocity, the width of the channel, the fullness, the presence of rapids and rolls of varying complexity in the channel of the Black Cheremosh create excellent conditions for the extreme type of water recreation - rafting. Near the waterfalls there are places for rest. In recent years, more and more salt and hydrogen sulfide sources are used to treat and heal.

Forest Fund of the Pokutsk Carpathians occupies more than half of their area -58% (Gostiuk, 2018). Forests are characterized by a high diversity of species composition, forest structure and types (Shparyk, 2015). Low mountain ridges (500-1000 m.) are covered mainly by beech forests. The forest beech formation is represented by spruce-fir-beech subformation (*Piceeto-Abieto-Fageta sylvatici*) and the group of quince bean associations (*Fageta oxalidos*). The formation of fir white

(*Abietela albae*) takes the second place to the prevalence in the low mountains and is always accompanied by beech. There are no pure fir forests, although there are areas where the fir is the predominant breed - in particular, in the composition of almost half of the lowland forest.

In the middle mountains on the slopes of mountain ridges with heights of 800-1100 m. The forest is dominated by beech forests (*Fageta sylvatici*), and the most common types of forest are fresh fir subhead (*Abieto-Fageta sylvatici*) and fresh spruce-fir subjut (*Piceeto-Abieto-Fieta-fageta sylvatici*). In the upper part of the middle mountain ranges 1100-1483 m. *Piceeto-Abieto-Fageta sylvatici* and fir-beech forests (*Abieto-Fageta sylvatici*) are common in the northern part of the country, and in the upper parts of the ridges above 1200 m. p. m. - fir wood (*Piceeta*), the formation of European fir (*Piceeta abietae*). It is represented mainly by subformation of pure spruce forests (*Piceeta*) (Shparyk, 2015, Debryniuk et al. 2017, Prorochuk, 2013). Locales of pine cedar European (*Pinus cembra L.*) (Rotilo, Gregit) occur on the highest ridges of the investigated area. In addition to the main forest species, there are almonds (*Alnus incana (L.) Moench*), hornbeam (*Carpinus betulus L.*), birch (*Bétula*), aspen (*Populus tremula L.*), in the undergrowth - mountain ash (*Sorbus*), goat's willow (*Salix caprea L.*), elderberry (*Sambucus racemosa*), honeyberry (*Lonicera*) (Prorochuk, 2013).

The meadow vegetation of Pokutk Carpathians is plentiful and plentiful. Most meadows in the region are after the forest, formed on the site of cut forests, they are used as hayfields and pastures. On typical meadows, of which more than 85% are common, typical species are: meadow fescue (*Festuca pratensis Huds*) and red (*Festuca rubra L.*), orchard grass (*Dactylis glomerata L.*), fragrant spike (*Anthoxanthum odoratum, L*), fowl-grass (*Poa trivialis L.*), browntop (*Agrostis tenuis* Sibth.), deervetch Ukrainian (*Lotus ucrainicus* Klok.), different types of clover (*creeping (Trifolium repens)*) and others, dandelion common (*Taraxacum Officinale* Wigg.), cow-parsnip European (*Heracleum sphondylium L.*), crowfoot plantain (*Plantago lanceolata L.*), cornflower (meadow and false frugian) (*Centaurea jacea L., C.pseudophrygia* Mey.), queen ordinary (*Leucanthemum vulgare* Lam.) and others. In spring the most widespread plants are the following: Saffron Gaiffon (*Crocus heuffelianus* Herb.), and other kinds of orchis (Fuchsian fistula (Soo.), sweetheart two-leafed (*Platanthera bifolia (L.)Rich.*), grasshopper round (*Traunsteinera globosa* (L). Reichenb.) and others) (Derzhypilskyi et al., 2011).

The water-loving plants are distributed along the banks of the reservoirs: white flint (*Petasites albus*), hybrid flint (*Petasites hybridus*), various species of chives (*Eleocharis*), common cane (*Phragmites communis*), broadleaf (*Typha latifolia*), cranberry and acanthus (*Ranunculus repens - Ranunculus acris*), etc.

Due to the diversity of vegetation on the territory of the Pokutsk Carpathians, utilitarian tourism and recreation have long been developing - harvesting berries, mushrooms, medicinal plants and drying grasses.

In the territory of the Pokutsk Carpathians mountainous forest soils (brown-soils) formed under forest vegetation. Burrows are characterized by weak differentiation of the soil profile on the genetic horizons, high acidity of the soil solution, relatively high humus content, and by mechanical composition these soils are light and medium loose, often rubbish and medium skeletal (Herenchuk, 1973, Prorochuk, 2013).

The wildlife of the Pokutsk Carpathians is rich and varied. From mammals, there are field mice (*Apodemus*), wild boar (*Sus scrofa*), European badger (*Meles meles*), common fox (*Vulpes vulpes*), white and red hedgehog (*Erinaceus roumanicus*), roe deer (*Capreolus capreolus*), forest marten fur (*Martes martes*), noble deer (*Cervus elaphus*), brown bear (*Ursus arctos L.*) (Prorochuk, 2004, Prorochuk, 2013).

The world of birds is represented by field lark (*Alauda arvensis*), ring dove (*Columba palumbus*), big tit (*Parus major*), gawk (*Cuculus canorus*), drill singing (*Turdus philomelos*), buzzard (*Buteo buteo*), grey owl (*Strix aluco*), green goiter (*Picus viridis*), common woodpecker (*Dendrocopos major*), white stork (*Ciconia ciconia*) (Prorochuk, 2004, Prorochuk, 2013).

Among the amphibians, the spotted salamander (*Salamandra salamandra*), quick lizard (*Lacerta agilis*), common triton (*Triturus vulgaris*), grass frog (*Rana temporaria*) are represented; from reptiles – water snake (*Natrix*), wild boar (*Zamenis longissimus*), common snake (*Vipera berus*); from fish - Danish salmon (*Hucho hucho*), Salmon trout (*Salmo trutta*), crucian (*Carassius*) and others (Prorochuk, 2004, Prorochuk, 2013).

In order to preserve biological and landscape diversity, 27 objects of the nature reserve fund, including the national natural park “Hutsulshchyna”, and a number of objects of the lower ranks - reserves, nature monuments, nature reserves, which have as natural, scientific, recreational value and aesthetic value (Fig. 1) (Brusak, 2017, Gostiuk, 2016, Hutyriak, 2016, Pelypeiko et al. 1997).

Protected areas and objects occupy 30% of the total area of the Pokutsk Carpathians (Gostiuk, 2016). In addition to objects that have an environmental status, there are other interesting objects that are worth the attention of tourists.



Figure 1. Pokutsk Carpathians'

Conclusions

The Pokutsk Carpathians are characterized by a large variety of natural conditions - relief, geological structure, climate, water resources, vegetation, soils, fauna and landscape complexes in general and have significant recreational-tourist potential. Nature conservation areas and objects are important for the development of tourism and recreation, in particular the national natural park "Hutsulshchyna" and hydrological reserves - the Black Cheremosh, Rybnytsya and Pistynka rivers.

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