

## PROSPECTS OF ECOTOURISM DEVELOPMENT IN CENTRAL KAZAKHSTAN

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**Abstract:** The ecotourism development in Central Kazakhstan, especially in the Karkaraly region is relevant, because the geosystems of Karkaraly lowlands have a diverse landscape and numerous attractions. The purpose of this work is to popularize the eco-route described in the article, as well as to provide recommendations and suggestions for the ecotourism development in Central Kazakhstan on the example of the Karkaraly Mountains geosystem. Research methods are field, descriptive, cartographic. The optimal route was identified on the basis of stock materials and also as a result of expedition research, and a map of the two-day eco-route was developed. Conclusions are made about the prospects of ecotourism development in the Karkaraly lowlands geosystems.

**Key words:** ecotourism, infrastructure, geosystem, biodiversity, ecological route

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### INTRODUCTION

Nowadays, the tourism development is one of the priority areas for each region of our country. One of the major areas of modern international tourism is ecotourism (Gladilin and Kotova, 2016; Hunt, 2022; Rafiq et al., 2022; Zeng et al., 2022). Adverse aspects of the mass tourism effect on the environment were noted in the 70s of the twentieth century in foreign researches. The growing number of environmental problems attracted the attention of scientists, the public, the business sector, etc. (Zhigula, 2015; Tavakoli et al., 2022). The various ecotourism organizations put in its understanding similar in tendency, but not absolutely certain sense. In some cases, this refers to trips arranged to virgin territories. In other cases, it is a form of tourism closely related to the principles of environmental protection. Ecotourism is very relevant and effective in maintaining the integrity and authenticity of ecosystems in unspoiled areas (Chandel and Kanga, 2020; Berdenov et al., 2016; Ilies et al., 2017; Beketova et al., 2019; Tokpanov et al., 2021). The International Ecotourism Society (TIES) has the following interpretation: ecotourism is a responsible trip to natural areas, regions, which preserves the environment and supports the well-being of local residents (Zhigula, 2015; Carvache-Franco et al., 2020; Akhmedenov et al., 2021). Scientists identify a number of advantages, the availability, which can make specially protected natural areas the main link in the ecotourism development:

- location in the most spectacular, attractive, interesting from a cognitive point of view places;
- availability of a well-established system of service for tourist groups, a tried and true tourist route system, experience in organizing educational work;
- availability of specific infrastructure and trained staff;
- a positive attitude of the locals to a particular natural object and the existing environmental restrictions on economic activities in its territory (Zvyagina, 2014; Gonia and Jezierska-Thöle, 2022).

Tourism development for national parks, unlike nature reserves, is one of the most important and officially declared activities. However, tourism development in national parks requires the provision of effective infrastructure (Gladilin, 2006). This paper aims to popularize the ecological route presented in the article, as well as to provide recommendations and suggestions to develop ecotourism in Central Kazakhstan based on the example of geosystems of the Karkaraly Mountains. In

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general, the nature of the Karkaraly State National Nature Park (KSNNP), intended to preserve the biological and landscape diversity, the use of unique natural sites and objects of the State Nature Reserve Fund (SNRF) with specific environmental, scientific, historical, cultural and recreational value for the purpose of nature conservation, environmental education, scientific, tourism and recreation, has perfect conditions for the successful development of ecotourism. Among the scientists who have been engaged in research of ecotourism in Kazakhstan, it is possible to note works of I. Akbar, who conducted researches on tourism development in the Aksu-Zhabagly sanctuary located in South Kazakhstan (Akbar et al., 2021). Significant contribution was also made by B. Aktymbayeva, who studied the tourism industry genesis and evolvement Kazakhstan (Aktymbayeva et al., 2021). N. Achilov analysed the prospects and advantages of the tourism industry development in Kazakhstan (Achilov, 2017; Keukenov and Dzhanaaleev, 2021). A Akhmedenov estimated the potential and conditions for developing the health tourism on the basis of therapeutic muds from salt-water lakes in West Kazakhstan (Akhmedenov et al., 2020).

## MATERIALS AND METHODS

The information base of the research included: literature sources, materials of previous botanical researches (Gorchakovsky, 1987), fund and published materials of republican and regional departments and institutions, data of the nature chronicle for 2019-2020 (Dzhanaaleeva, 2010).

Research methods: field, descriptive, cartographic (Figure 1).

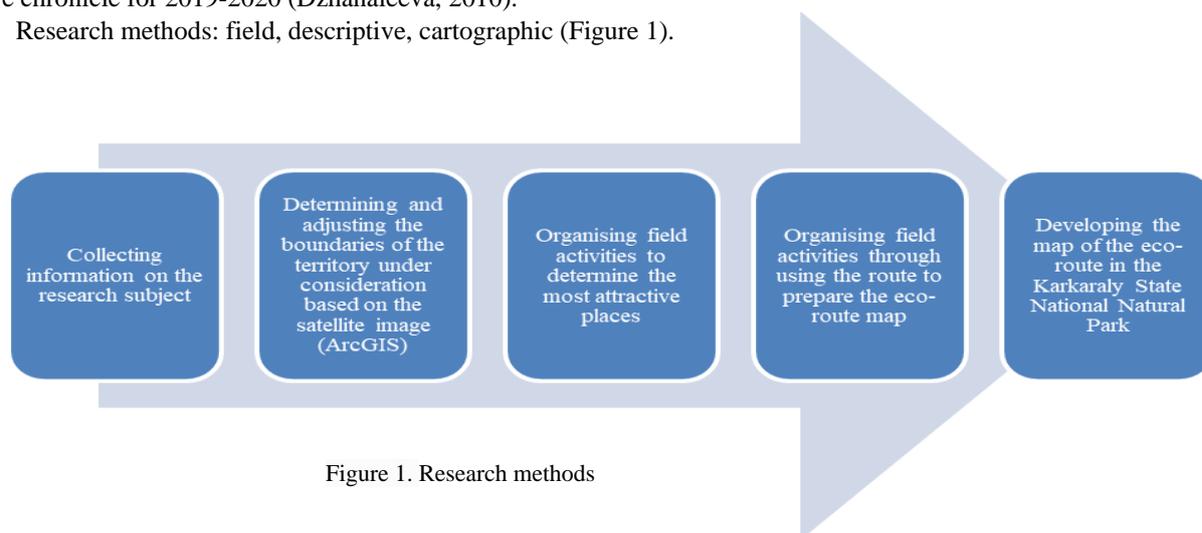


Figure 1. Research methods

The Karkaraly State National Nature Park (KSNNP) was created in 1998 with the purpose of preserving and restoring the unique natural sites of the Karkaraly and Kent mountain massifs. This area is a favorite vacation spot for residents of both the Central Kazakhstan and the country as a whole. The geosystems of the Karkaraly low-hill terrains are located in the eastern part of the Kazakh Uplands in the territory of Karkaraly district of Karaganda region. They are shallow-hill relief with isolated massifs of low-hill terrains, extending from north - north-west to south-east for 30-35 km, and 20-25 km wide.

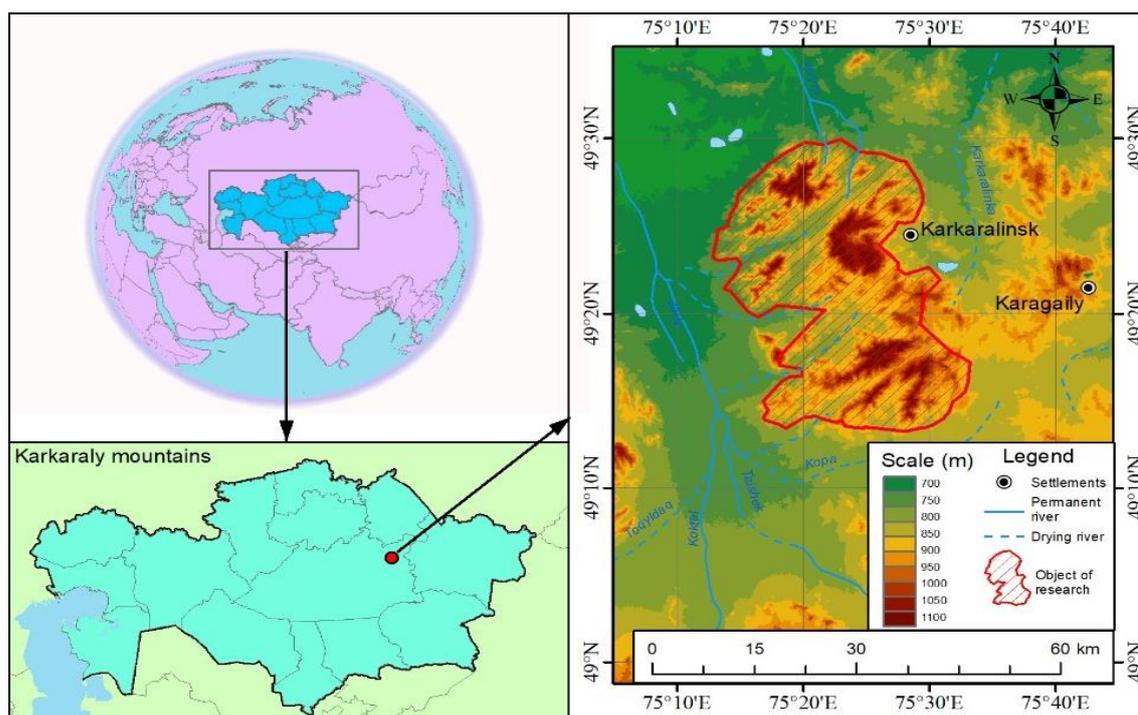


Figure 2. Location of the study area (Source: compiled by Keukenov in the ArcGIS program)

The mountains are ones of the highest in the Central Kazakhstan and comprise separate ridge mountains (Zhirensakal, Akterek, Myrzashoky, Karkaraly, Buguly, Koktobe, Shankoz). The highest peak is Komsomolsky Peak with a height of 1403 m above sea level, which is part of the southern ridge of Zhirensakal. To the south-east of this ridge are Akterek Mountains with a height of 1230 m above sea level and Myrzashoky with a height of 1170 m above sea level. To the north, the Karkaraly ridge with a height of 1115 m above sea level (that gave its name to the entire mountain and forest massif), Buguly ridge (1323 m above sea level) and the Shankoz ridge with a height of 1360 m above sea level are situated. To the west, there is the seven-peaked Koktobe (1254 m above sea level). The Karkaraly mountain and forest massif is divided by wide intermountain valleys Kendara, Kurozek, Karatoka and others, and is rich in fresh groundwater (Figure 2).

The diversity of relief and soil continuum determined the evolution of phytodiversity. The considered area is almost completely located in the subzone of dry steppe of the landscape-climatic zone. Pine forests with undergrowth of *Rosa spinosissima*, *Rosa majalis*, *Juniperus communis*, *Lonicera tatarica*, *Padus avium*, *Crataegus sanguinea* mainly grow in the Karkaraly low-hill terrains. They account for 71.3% of the total area of mountain forests. Birch groves (*Betula pendula*, *B. pubescens*) are confined to the hillsides of northern and northeastern exposition, to inter-slope valleys, along rivers and streams. They occupy 10% of the forested area, about 2% of the forested area is covered by aspen forests (*Populus tremula*), confined to the relief depressions, river and stream valleys, the base of round slopes (Dikareva and Leonova, 2014; Keukenov and Dzhanaaleev, 2021; Berdenov et al., 2021; Indrie et al., 2020).

## RESULT AND DISCUSSION

Ecotourism contains a number of key criteria:

- natural landscape, attractions, biodiversity present in the tour area that fascinate tourists;
- geosystem features, where the focus is on exploring and understanding resources as such, the travelers' activities have minimal impact on the physical and cultural environment in the area visited.

Ecotourism components are natural, historical and cultural potential of the territory or region, which includes natural objects, social and cultural constituent with traditions and customs, specifics of household and economic activities.

The Karkaraly low-hill terrains were formed under the influence of endogenous and exogenous processes. The endogenous processes lie deep in these low-hill terrains. This macrostructure was formed under the impact of endogenesis (Abdulin, 1994). During the Mesozoic, when the entire territory of Kazakhstan was covered by the sea, massive loose sedimentary deposits were formed on the slopes of these lowlands. The most important parts of the macrostructures were formed in the Quaternary period. But the main stage of formation of the Karkaraly Mountains macrostructure is the Neogene and Quaternary periods. Since the altitude of the low-hill terrains is just over 1,500 meters, the geosystems of the Karkaraly Mountains are regarded as young. In other words, all their dynamics refers to the Quaternary period. Therefore, the relief in the territory of the Karkaraly low-hill terrains is formed with alternating areas of peneplain with Quaternary sediments, residual ancient peneplainized areas, which are changed under the influence of exogenous factors (Dzhanaaleeva, 2010). Pine forests (*Pinus sylvestris*) are mostly represented by lichen, mixed herbs, moss and mixed herbs types, located on steep slopes of narrow gorges and occupy intermountain valleys. At the bottom of hollows there are small areas with the boreal fine grasses *Chimaphilla umbellata*, *Moneses uniflora*, *Orthillia secunda*, *Pyrola chlorantha* in herb-shrub layer, along the slopes there are coniferous forest species *Solidago virgaurea*, *Trifolium lupinaster*. On weathered granites in pine forests there are mesoxerophytes: *Allium nutans*, *A. lineare*, *Veronica incana*, *Orostachis spinosa*, *Melandrium viscosa*. In lichen pine forests herbaceous plants are abundant: *Carex supine*, *Antennaria dioica*, *Archyrophorus maculate*, *Dracocephalum nutans*, *Fragaria vesca*. In the steppe forests described, apart from typical representatives of boreal flora, there are also nemoral relicts, including some species peculiar to broad-leaved and coniferous-broad-leaved forests: heartwood (*Cardamine impatiens*), meadow-grass (*Poa nemoralis*), European hazelwort (*Asarum europaeum*) (Gorchakovsky, 1987; Shomanova et al., 2020).

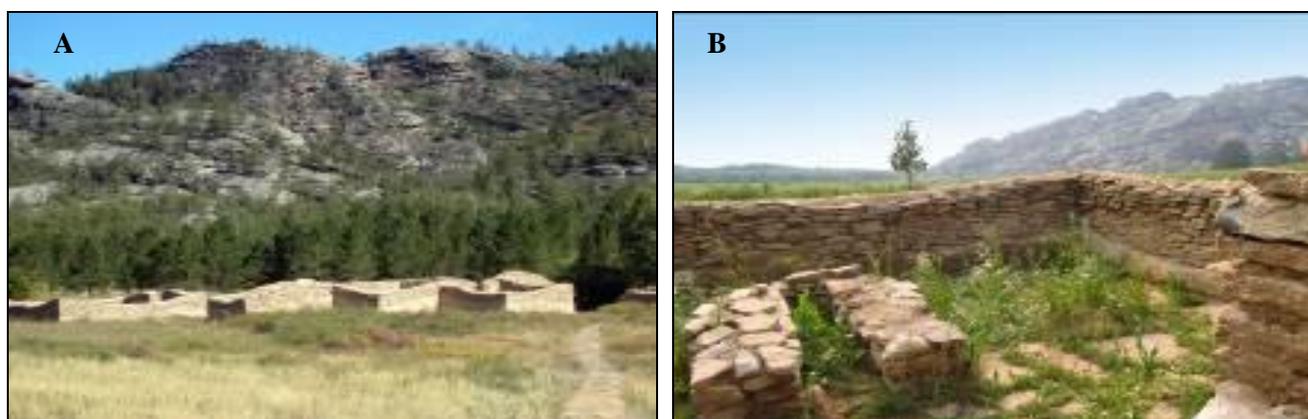


Figure 3. "Kyzylkent Palace" in the Kent Mountains (Photo by Y. Keukenov. August 10, 2021)

A - entrance to the Kyzylkent Palace; B - Kyzylkent Palace (Source: Keukenov)

The territory of the "Kyzylkent Palace" is attractive for its history, on its territory there was a city with an area of at The regional peculiarity of forming the tourist and recreational potential of Karkaraly district is a diversity of attractive natural

resources. The nature provides prerequisites for the development of ecotourism that is the most probable in the territory of the Karkaraly State National Nature Park (KSNNP). The developed tourist paths and routes are of particular importance, and the role of the Karkaraly Mountains is significant. Their distinctive feature is an abundance of springs with fresh, clean water. The locals especially distinguish Suykbulak spring with sparkling water with year-round temperature of +6°C, to which they attribute miraculous properties. A unique object having the status of a historical monument of national importance is an architectural complex of Begazy-Dandybayev era in the Kent Mountains - "Kyzylkent Palace" (Figure 3).

Least 30 hectares, divided into streets and quarters, in which several thousand inhabitants lived. The quarter of metallurgists who smelted copper and bronze is clearly visible. Craftsmen made weapons, horse equipment, jewelry. In the center of the settlement, the Kyzylkent Palace is a Buddhist monastery of the second half of the 17th century.

The numerous ancient legends and tales, remarkably rich fauna, peculiar flora represented by a large number of relict plants of the glacial period, unique mountain lakes and geological formations make the area especially popular (Figure 4).

Historical monument "Forester's house" (1910-1913), built and decorated with woodcarvings by craftsman I.Y. Smetankin, more than 30 archaeological sites, represented by burial mounds, burial grounds, the ancient settlements are located on the territory. There is a Museum of Nature in the Karkaraly State National Nature Park (KSNNP), which consists of the ornithofauna, phytofauna and demonstration halls, with 60 exhibits of birds and animals, 9 stands with entomofauna, a stand with minerals and herbaria of more than 250 plant species. The zoological enclosure adjoining the museum covers an area of 80 hectares and houses deer, yaks, white-spotted deer, bison, and bear. There are 7 natural monuments in the Karkaraly State National Nature Park (KSNNP): a bizarre natural structure - "Stone tent"; "Three caves" or "Primitive man's cave" located in Maliksay natural boundary - a small stone canyon of granite slabs and three underground entrance holes, the place of human encampments of New Stone and Bronze ages; "Siberian fir" situated in Komissarovka natural boundary, plantation of fir trees of 1920s; "Siberian larch" - the first larch planted in 1940; "Aspen-leaved maple" planting - one tree of 1914 planting; Shaitankol and Bassein lakes situated among the mountain and forest massif and being a distinct decoration of the area. Bassein Lake resembles a huge quadrangular granite box filled with water, 5 meters deep. Shaitankol Lake, or Devil's Lake, has spawned a lot of legends and tales, works of modern writers and poets. The best time to visit the lakes is spring, summer and autumn. An important element is that tourists can visit the objects of the same name, the route "Historical Monuments" is designed for educational purposes.



Figure 4. Notable objects of the Karkaraly State National Natural Park  
A – lake Swimming pool; B – museum of nature; C – primitive man's cave (Source: Keukenov)

The scenic beauty of nature combined with the clean forest air attracts a lot of visitors to the recreation areas. Amateur mountain hikes including climbing Karkaraly Peak (formerly Komsomolsky Peak), rising to 1403 m, as well as leisure hikes to Shaitankol and Bassein lakes are popular among tourists. The mountainous terrain is conducive to the development of biking, in particular mountain biking. The hasteless rest also includes picking mushrooms and berries, swimming in the Pashino Lake, etc. A ski resort with a chairlift is especially popular. The district center, Karkaraly city, is a point of interest. Karkaraly is the oldest city in Karaganda region, with an important place in the economic and cultural life of the region. A significant role in the development of the city is given to cultural-historical, educational and medical and health tourism. The history of the city began in August 1824, when a fortress was founded, and three years later transformed into a Cossack village. In 1869, Karkaraly was designated a county town. In the 19th century, the caravan routes from Central Asia to Siberia passed through the town. The city is a major asset for historical, cultural and literary tourism, since it has many places associated with the lives and work of famous politicians, literary figures and artists, educators, scientists and travelers (figure 4). Scientific information about Karkaraly was first published in 1865 in the second edition of the Geographical and Statistical Dictionary of the Russian Empire, edited by P.P. Semyonov Tyan-Shansky. It was the first time Russia learned about the green oasis of mountain caves and monuments of the history of primitive culture. The major city attractions are the historical places and monuments: the House of Abai, the Kunanbay kazhy mosque, the old buildings of merchants Ryazantsev and Bekmetov, history and local history Museum with more than 5000 exhibits, etc. Among the modern monuments of architecture are the Alley of Heroes, the Gallery of Glory "Baiterek", the Memorial Complex of Glory "Saryarka Pilots" with the MIG combat aircraft.

The abundant and diverse floristic composition of Karkaraly oasis provides an opportunity to develop scientific tours, photo-tourism, formation of scientific collections - herbariums in the area. In the forests of Karkaraly Mountains

(the area of forested land is 53.6 thousand hectares), coniferous, with the dominance of pine, which has phytoncidal properties and creates a therapeutic effect, prevail. Birch, aspen, willow, and bird cherry are also found.



Figure 5. Museum of History and Local Lore of Karkaralinsk (Source: Keukenov)



Figure 6. Wormwood smooth  
(Source: herbarium collected by Keukenov along the route of the 2020 expedition)

Karkaralinsk is the birthplace of wormwood (figure 6). This relict plant is used in the Karaganda Phytochemistry Institute to produce the antitumor drug Arglablin, for cancer treatment (Adekenov, 2020).

Urbanization predetermines the creation of ecological routes – weekend trips that will meet the needs of people in regular temporal recreation and rehabilitation of physiological and spiritual strength, a change of surroundings and experiences, a variety of leisure activities and emotional saturation of pastime, with a high degree of intensity and frequency based on affordable price-quality tourist weekend trips (Suleimenov et al., 2022).

As a result of expedition research conducted in 2020-2021, the optimal weekend route to the protected area of the Karkaraly State National Nature Park (KSNNP) was developed. The route program is shown in Table 1 and Figure 7.

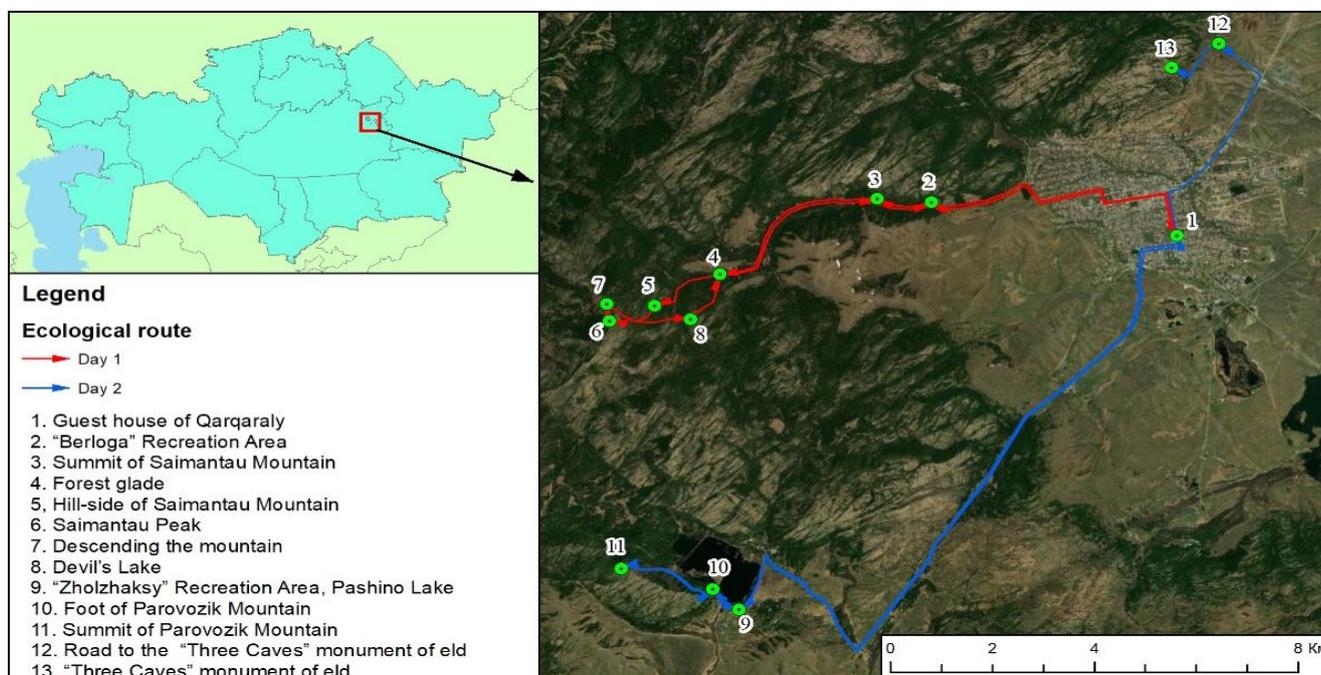


Figure 7. Map of the ecological route of the Karkaraly State National Natural Park  
(Source: developed by the author in ArcGIS, Picture taken from ArcGISonline)

The route was developed based on the departure from the regional center, Karaganda on January 29, 2021, time to reach the attractive sites (Figure 8) was measured with the accommodation in a guest house. The route assumed a record of movement on the GPS navigator with the highlighting of campsites and attractive recreational areas (Table 1).

Table 1. The ecological route to the Karkaraly State National Natural Park (KSNNP)

	№	Object	Time of stay	Lenght, m	Coordinates (WGS 84)
Day 1	1.	Departure from Karaganda	7:00		49.804883, 73.096593
	2.	Arrival at the guest house	10:00	265200	49.407408, 75.479192
	3.	Start of the hiking route – “Berloga” Recreation Area	11:00	4042	49.411677, 75.435947
	4.	Road to the summit of Saimantau Mountain	11:30	725	49.412150, 75.426321
	5.	Forest glade	12:30	2551	49.402429, 75.398606
	6.	Hill-side of Saimantau Mountain	13:20	1051	49.398388, 75.387128
	7.	Saimantau Peak	14:30	705	49.396456, 75.379168
	8.	Descending the mountain	14:45	260	49.398632, 75.378687
	9.	Devil’s Lake	15:30	1175	49.396639, 75.393385
	10.	Forest glade	16:30	819	49.402429, 75.398606
	11.	End of the hiking route – “Berloga” Recreation Area	17:30	3276	49.411677, 75.435947
	12.	Return to the guest house	18:00	4042	49.407408, 75.479192
Day 2	1	Check-out from the guest house	10:45		49.407408, 75.479192
	2.	Start of the hiking route – “Zholzhaksy” Recreation Area, Pashino Lake	11:00	10306	49.359389, 75.401935
	3.	Foot of Parovozik Mountain	11:30	461	49.362016, 75.397301
	4.	Summit of Parovozik Mountain	12:30	1339	49.365113, 75.380875
	5.	Foot of Parovozik Mountain	13:15	1339	49.362016, 75.397301
	6.	End of the hiking route – “Zholzhaksy” Recreation Area, Pashino Lake	13:45	461	49.359389, 75.401935
	7.	Return to the guest house	14:00	10306	49.407408, 75.479192
	8.	Road to the “Three Caves” monument of eld	16:00	3441	49.432071, 75.486543
	9.	“Three Caves” monument of eld	16:15	916	49.428893, 75.479094
	10.	Return to Karaganda	20:15	4357	49.804883, 73.096593



Figure 8. Expedition photos from the ecological route in the Karkaraly State National Nature Park (KSNNP) (photos by the author)  
 A – summit of Parovozik Mountain, photo by the author; B – summit of Saimantau Mountain, photo by the author;  
 C – “Three Caves” monument of eld, frozen waterfall (Source: Keukenov)

## CONCLUSION

As a result of the study of Central Kazakhstan, it was found that the most attractive area for tourism development is the Karkaraly State National Nature Park (KSNNP). Based on expedition research conducted in 2020-2021, 7 natural monuments were marked along the route: a bizarre natural structure - “Stone tent”; “Three caves” or “Primitive man’s cave” located in Maliksay natural boundary - a small stone canyon of granite slabs and three underground entrance holes, the place of human encampments of New Stone and Bronze ages; “Siberian fir” situated in Komissarovka natural boundary, plantation of fir trees of 1920s; “Siberian larch” - the first larch planted in 1940; “Aspen-leaved maple” planting - one tree of 1914 planting; Shaitankol and Bassein lakes, the cultural and historical heritage of Karkaraly.

As a result of studying the natural environment of the Karkaraly State National Nature Park (KSNNP), the two-day ecological route was developed, taking into account the recreational attraction and rich floral diversity, and the herbarium was collected for species identification.

Tourist opportunities of the Karkaraly State National Nature Park (KSNNP) geosystems have a sufficient number of advantages: convenient geographical location, well-preserved natural potential, rich cultural and historical heritage.

In order to effectively use the natural potential of the Karkaraly State National Nature Park (KSNNP), it is suggested to introduce a weekend ecological route with accommodation in guest houses. The development of ecological routes involves the transformation of the tourist and recreational infrastructure (tourist information, eco-educational and ecotourist visitor centers, tourist maps of recreational and historical and cultural attractions).

Forecast assumptions for the research object development: a developed scientific implementation of ecological routes in the tourism industry may be used to prepare standard recommendations for the rational arrangement and planning in the recreation and tourism industry at the regional level and the analysis of its contribution to economic development in the short-, medium- and long term.

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