Historical-cultural education functions of geosystems of specially protected nature areas on the example of the Pribaikalsky National Park

A V Myadzelets
V B Sochava Institute of Geography, SB RAS, Irkutsk, 664033 Russia

E-mail: anastasia@irigs.irk.ru

Abstract. The paper considers the role of historical-cultural objects in the forming educational functions of geosystems. This task is essential for specially protected nature areas, where educational ecotourism activity is implemented. A model area is the Pribaikalsky National Park. We studied historical peculiarities of formation of the local natural complexes, socio-cultural and other anthropogenic processes that influenced the modern configuration of the park landscapes. The research revealed that various relief forms, geographic object location and vegetation have the primary role in determining the historical-cultural functions of geosystems. Modern socio-economic and tourist infrastructure, in contrast to old settlements, gravitates towards the local historical-cultural sites. The created geoinformation database includes different characteristics of the local historical-cultural objects. These are a type, location, availability, approximate historical time age and significance for educational tourism development. In the result we also presented a fragment of the schematic map of the historical-cultural, archaeological and other object significance for educational tourism on the one of the key plots of the Pribaikalsky National Park. The determining the historical-cultural functions of geosystems is important for assessment of the recreational potential of the territory and further mapping recreational and educational activity goals for national parks.

1. Introduction
At present in Russia the annual quantity of visitors on specially protected nature areas (SPNAs) increases in connection with realized modern recreational government policy, better transport accessibility, higher population mobility and cognitive interest of people. National parks with different types of recreation activity becomes very popular. Usually their nature peculiarities that form the recreational potential including educational one, are studied and popularized on a good level. Modern basic geographical, sociological, archaeological and other scientific fields accumulated a lot of information about old and contemporary archaeological and cultural-historical objects, constructions, monuments and artefacts which included in functioning the local geosystems and characterizing features of ancient, medieval and new society. At the same time, although the educational potential of these objects is very high and the cognitive interest of tourists who visit the SPNAs is not limited only by nature attractiveness of the territory, the population in general do not know enough about them.

The goal of the research is to reveal and evaluate the educational functions of the geosystem historical-cultural potential of the SPNAs on the example of the Pribaikalsky National Park (PNP). The author also considers historical peculiarities of local nature complex forming and social-cultural, social-economic and other anthropogenic factors affected the modern state of the park landscapes.
2. Models and Methods

System and polisystem theories, quantitative and qualitative methods of geographical object analysis [1], ecosystem theory [2], geoinformation and landscape-interpretation mapping approach [3], remote sensing data and remote images processing are the basis of the research. Traditional geographical data collection methods are also used for the detailed exploring the historical-educational geosystem functions. These are scientific publications and maps, expedition and fieldwork data, characteristic description and comparing of different living biological, inanimate and anthropogenic origin objects such as the landscapes and their components, archaeological objects, cultural, social and economic infrastructure created in different periods of the anthropogenic activity. Also, we used a geomorphological map with the differentiation on relief types and a map of the recreational-potential assessment [4], information about location of different archaeological and geological monuments [5-7], vegetation types and some peculiarities of the social-economic and road infrastructure. Spatial information is processed and mapped using ArcGIS software.

The Pribaikalsky National Park is a structure division of the FSE Zapovednoye Pribaikalye. It is situated on the western shore of Lake Baikal from the eastern slopes of the Primorsky Range to the southern part of the Olkhinsky Plateau and also includes Olkhon Island. There are plane and mountain landscapes, dry steppe, wet meadow and taiga nature complex on its vast area. The park is not a closed area for visitation. There are different types of tourist activity here during all year with some cycles of the seasonal dynamics. The highest visitation level is in the summer months such as July and August. The most visited area is the Priolkhonye and Olkhon Island as the water of local small shallow bays of Lake Baikal is the warmest. Increasing the population mobility, improving the transport availability and infrastructure and people cognitive interest are favourable conditions for rising the number of tourists on this territory.

Determination of the historical-cultural educational geosystem functions is closely connected to geomorphological peculiarities of the territory. For the first time, in 1988, A V Vasyanovich defined the geomorphological conditions of the Priolkhonye as a basis of recreational usage [8]. The lack of the research was that he considered that conditions only as a source of some geomorphological risks in context of the dynamic anthropogenic effects. Then, for this area, professor S B Kuzmin studied the relief and corresponding nature geological and geomorphological significant sites as a resource for ecotouristic development and rational nature utilization [9]. Moreover, other geographers published their special and aggregate results of studying different sides of ethno-nature interactions, ethno-cultural society development and relevant landscape changes on the local level for this territory [10-12].

For determining the historical-cultural educational geosystem functions is also important to study the recreational features and inquiries of visitors. Different active and stationary (passive) recreation types are fit for the western shore of Lake Baikal [13-15]. The main directions here except water kinds are ecological, sanatory, excursion, educational, scientific, sports, religious, and entertainment tourism. These types of recreation activities include hiking, walking, excursion, cultural-educational, sports and adventure trips along ecological routes to the places of historical, archaeological and natural value. Also, there are bathing and beach or fishing recreation, picking mushrooms and berries on the territory. The sport and adventure categories include automobile, cycling, skiing, hiking, equine tourism and a number of specific types such as speleotourism, mountain climbing, etc. In recent years, so-called event and entertainment tourism is developed in the Baikal region. This recreation trends are the reason of emergence of various positive and negative socio-economic and other factors. Particularly, these are legislative changes and environmental restrictions in the field of nature management in the Baikal natural territory, general stagnation and depression of economic and socio-demographic processes on remote areas, the need to withdraw of the local small villages and households from the crisis state. In addition, the visitors who are consumers of the touristic product changed their behavioural reactions and needs. For example, this is increased demand for services related to the entertainment industry and the organization of various sports, scientific, leisure, thematic events, including the seasonal cycles.
Thus, the natural, geomorphological, historical-cultural, and recreational potential of the model territory is known quite well, but the results and research directions are not connected by united scientific context with the physical-geographical basis, relief features and the formation of original natural and cultural landscape space.

A part in the coastal zone of Lake Baikal on the territory of the Priolkhonye from the village of Buguldeika to the village of Kocherikova is a model transect for the detailed analysis of the historical and cultural potential and the corresponding educational geosystem functions. The field research in the area is carried out in 2020 and 2021. We identified several typical key plots with various types of relief, vegetation and objects of historical and cultural heritage based on the results of the expeditionary work. They have recreational value and educational interest for a wide range of visitors. There are many various ancient burials and burial grounds, ritual and cult places, former “settlements”, petroglyphs, abandoned and active social and infrastructural objects of ancient, medieval and newest history with the cultural value on the transect area (Figure 1).

Figure 1. Examples of the cultural and historical natural and anthropogenic objects on the territory of PNP (Priolkhonye area): a – single burial; b – a modern ritual complex for ethnic rituals (the Kocherikova river); c – a fragment of the ancient irrigation system in traditional nature management (area of the village of Kocherikova); d – marble quarry as the abandoned object of the modern industry, which is a point of the aesthetic and cognitive interest for the visitors (the village of Buguldeika).
The toponyms of the certain nature plots and objects of the old social infrastructure are the particular category of nonmaterial phenomena which also have important cultural-historical and recreational value. They are connected with the local geomorphological and geographical features of the territory. There are significant number of various natural and anthropogenic objects on the territory of the park. At different times they were involved in the functioning of the local geosystems, became a part of the natural and cultural landscape and got significant cultural, historical, educational and general developmental functions for the modern society.

3. Results and Discussion

Various relief forms as a geomorphological and physical-geographical basis of the recreational and educational landscape potential formation [4], the location of geographical objects as well as the vegetation types play the important role in determining the historical and cultural functions of geosystems. All together with the material and non-material cultural and historical potential, they are structural elements that form a certain system of relations on the territory. For example, the location of burial grounds is associated with flat, levelled open surfaces of terraces occupied by steppe landscapes, while they are often surrounded by rare stands of pine and/or larch. Open hills with rocky slopes as well as river bodies, valley and flat areas are common places for ritual complexes. It is associated with the peculiarities of various ancient rituals, when the scenario and purpose of the rite, frequency, toponym and others ancient cultural factors are the main reasons of the choice of their place. Rock paintings (petroglyphs) are located as a rule in remote, poorly accessible areas on rocky ledges, more often isolated, located far from infrastructure objects like road network, buildings, etc.

In general, we identified more than 200 different geographical historical, cultural, ethnographic, archaeological and other objects based on studying scientific literature, cartographic materials and field work. As a result, a geoinformation database was created with various characteristics of these objects. They include a type, location, distance from settlements or infrastructure, approximate time period and significance for the development of educational tourism. Schematic maps of the significance of the historical, cultural, archaeological and other objects and sites for the educational tourism development on the territory of the PNP is made using the geodatabase information. The Figure 2 illustrates one of the key plots of the model transect where there are accumulation of the cultural and archaeological monuments in the area of the Anga river mouth.

The author distinguished the following main types of the objects for the different educational potential purposes: archaeological, geographical, ethnographic, toponymic as well as complex, for example, ethnogeographic, ethnoarchaeological, etc. The significance of the objects for the development of the educational tourism potential is defined from 1 to 3 score. One score corresponds to low significance, and three to high. The assessment took into account such qualitative features of the objects as historical, geographical value, view, potential interest for tourists, accessibility, proximity to infrastructure, etc.

Thus, as a result of the work the author identified and mapped certain locations of the geoarchaeological, cultural-ethnographic, historical and social objects and sites as well as the objects with some toponymic features on the study area. Established contemporary socio-economical and touristic infrastructure of the PNP such as the road and trail net, camp sites, tourist hostels gravitate to such objects because they are the points of interest of prospective visitors. As for the old settlements located on the territory of the park, they are not situated with a close proximity to the ancient ceremonial sites. Usually they are located on the considerable distance from them. The significance, different potential development purpose of the educational tourism (ethnographic, scientific, excursion, hiking) of the defined recreational-geomorphological, nature-archaeological, geological and other complex are proposed depending on physical-geographical, infrastructural and other local characteristics on the model transect of the PNP.
4. Conclusion

Cultural-historical objects originate relevant educational geosystem functions during the time and process of the territorial development. They play the important role for forming the recreational and educational potential of the SNPAs. It can be used for different purposes like cognitive, excursion, hiking, fact-finding or cultic trips for active and passive, ecological, educational and scientific tourism. The nature-anthropogenic objects and artefacts including different material and nonmaterial historical, geological, ethnographical, infrastructural and cultural objects and sites are attractors both for the local communities following ancient traditions, and the park visitors and guests who want to get new information about the history of nature and ethnic group intercommunication. The definition of the historical-cultural geosystem functions is necessary for the recreational potential evaluation of the territory. It is one of the investigation stages for mapping of recreational use goals, designation of tourist attraction zones, creating specific social and recreational infrastructure and planning cognitive excursion tours for the national parks. All together they are to provide the basis for studying the educational functions and the nature ecosystem educational potential on the NPAs. Also, it is recommended for application in improving of environmental management models and nature protection activity.
Acknowledgements
The reported study was funded by RFBR and NSFC according to the research project No. 20-55-53030 NSFC_а».

References
[1] Cherkashin A K 2005 Polysystem Modelling (Novosibirsk: Nauka) p 280 (In Russian)
[2] Sochava V B 1978 Introduction to the Theory of Geosystems (Novosibirsk: Nauka) p 320 (in Russian)
[3] Bessolitsyna E P et al. 2005 Landscape-Interpretation Mapping (Novosibirsk: Nauka) p 424 (In Russian)
[4] Kobylykin D V and Myadzelets A V 2020 Recreational-geomorphological potential of the western shore of Lake Baikal Geography and Natural Resources 5 79-84 DOI: 10.21782/GIPR0206-1619-2020-5(79-84) (In Russian)
[5] Goryunova O I and Svinin V V 1995 Olkhonskii District. Archeology. Historical-Cultural Heritage of the Irkutsk Region (Irkutsk: Publishing House of Irkutsk State University) vol 1 p 140 (In Russian)
[6] Goryunova O I and Svinin V V 1996 Olkhonskii District. Archeology. Historical-Cultural Heritage of the Irkutsk Region (Irkutsk: Publishing House of Irkutsk State University) vol 2 p 214 (In Russian)
[7] Goryunova O I and Svinin V V 2000 Olkhonskii District. Archeology. Historical-Cultural Heritage of the Irkutsk Region (Irkutsk: Publishing House of Irkutsk State University) vol 3 p 184 (In Russian)
[8] Vasyanovich A V 1988 Geomorphological conditions of recreational use of the middle Priibaikalie Geography and Natural Resources 4 72-8 (In Russian)
[9] Kuzmin S B 2004 Geoeological Analysis of Relief (Irkutsk: Publishing House of Institute of Geography SB RAS) p 181 (In Russian)
[10] Abalakov A D, Pankeeva N S, Sedykh S A, Novikova L S, Drokov V V and Maryshkin D I 2013 Reconstruction of the Khuzhir-Nugayskaya traditional farming system to maintain traditional land use and development of ethno-ecological tourism Bulletin of the Buryat State University 2 123-34 (In Russian)
[11] Kuzmin S B, Abalakov A D, Belozertseva I A and Shamanova S I 2015 Ethno-natural systems of Priolkhon region Modern Problems of Science and Education 1-1 1839 (In Russian)
[12] Kuzmin S B, Danko L V, Andreeva I O and Bezrukova E V 2006 Stages of anthropogenic transformation of landscapes of Priolkhon region (Western Near-Baikal region) Izvestiya RAN. Seriya Geograficheskaya 1 47-60 (In Russian)
[13] Tsyrenova I Zh 2011 Comparative assessment of tourist-recreation resources and peculiarities of use of nature of national parks of the Baikalskii region Regionalnie Issledovania 4(34) 81-7 (In Russian)
[14] Yevstropieva O V 2016 Development of the tourism system on the Baikal Natural Territory Geography and Natural Resources S5 184-90 DOI:10.21782/GIPR0206-1619-2016-5(184-195) (In Russian)
[15] Zabortsyeva T I and Yevstropieva O V 2009 Current socio-ecological problems of recreational development of Pribaikalsky National Park Geography and Natural Resources 4(30) DOI:10.1016/j.gnr.2009.11.010 359-66