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METHODS OF FUNCTIONAL ZONING OF PROTECTED AREAS FOR DEVELOPMENT OF ECOLOGICAL TOURISM

Abstract: The influence of territorial structures on the formation of functional zones in protected areas is analysed. The need to identify spatial combinations of the most valuable elements of the territorial structure is formulated. The zone configuration is determined by areal, linear and single territorial structures. These are also components of specialized frames. Influence on the location of functional areas is produced by: environmental framework (reserves, specially protected areas, educational tourism zone, protected area); ecocultural frame (area of protection of historical and cultural objects, area of traditional nature management); natural recreational frame (recreational area, area of visitor services, especially protected area); transport frame (economic area and area of visitor services). Currently, research in the field of spatial development of ecotourism territories is fragmentary. Therefore, there is a need to develop a theoretical model of urban development of ecological tourism territories, the spatial organization of which should be based on the principle of active prevention of environmental violations in the development of recreational activities.

Key words: area of cultural tourism, protection area of historical and cultural sites, recreational area and tourist services, traditional land use area

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Introduction

Protected natural territories are created for the protection and reproduction of valuable natural landscapes, historical and cultural heritage, environmental education of the population, as well as for the organization of recreational activities with minimal harmful effects on the environment. As a result, urban development of the territory is allowed for the development of ecological tourism in protected areas (organization of information centres, ecological trails and tourist routes, observation decks, recreation areas). The contradictions arising between the recreational use of the territory and the preservation of natural and cultural heritage, leads to the need to manage the process of recreational impact. The management tool is a modelling method that provides the necessary synthesis of knowledge about the human environment. Currently, research in the field of spatial development of ecotourism territories is fragmented and fragmented. Therefore, there is a need to develop a theoretical model of urban development of ecological tourism territories, the spatial organization of which should be based on the principle of active prevention of environmental violations in the development of recreational activities.

The purpose of this study is to develop a theoretical model of urban development of the territory of ecotourism on the principles of sustainable development. To achieve the purpose of the study, the following tasks were set: 1. To identify environmental, socio-economic problems arising during the development of natural tourism; 2. To analyse the historical experience of urban development of protected areas, the functions of which include the development of tourism; to classify ecotourism territories. 3. To study the impact of factors on the spatial development of ecological tourism; 4. To determine the methodological basis for modelling the urban development of protected areas, the functions of which are the development of ecological tourism; 5. To identify spatial patterns of urban planning formation of a steadily developing ecotourism territory; 6. To develop a theoretical model of urban development of the territory of ecological tourism on the principles of sustainable development.

The object of research: ecotourism territories that are steadily developing in Russia and the world. The subject of the study is a set of necessary measures of urban development that contribute to the sustainable spatial development of the ecotourism territory. The boundaries of the study. Spatial: Specially protected natural areas whose functions include the development of ecotourism. Chronological: the scope of the study is limited by the history of ecotourism development.

Materials and Methods

The research methods include generalization and analysis of the theory and practice of modelling for solving urban planning problems. This study is based on the principles of a systematic approach using structural-functional, object-oriented methods of predictive modelling.

To solve the tasks, the following are used: 1. Historical and genetic analysis - the study of the emergence, formation, dynamics and prospects for the development of ecotourism territories; 2. Interdisciplinary approach (study of research in the field of tourism, ecology, sociology, geography, history, cultural studies, mathematics); 3. Framework approach; 4. Scenario approach; 5. Social approach; 6. Cartographic method of territory assessment -

analysis and identification of patterns of spatial organization of ecotourism territories; 7. Theoretical modelling, experimental design.

Influence of the nodal structures of the ecological framework on the definition of protected areas (zapovedniks) and specially protected natural areas (SPNA)

The preserved core is the territory most important for the preservation of the existing ecosystem. Most often it is a large ecological node where the main ecological corridors converge (for example, the Putoran Plateau or the mountain node of the Eastern Sayan in the Krasnoyarsk Territory).

The function of the reserve zone is the preservation of the most valuable ecosystems; therefore, ecological nodes and ecological corridors of the ecological framework (Gerasimov, 2006; Voronov & Narbut, 2013; Voropaeva, 2011; Myrzagalieva, 2015; Parsunkova, 1999; Parsunkova & Sohina, 1996; Yamashkin, Yamashkin & Zarubin, 2017), on which the biological diversity of the local flora and fauna depends and the livelihoods of indigenous peoples. The elementary components of the framework in most cases have linear forms and can, in terms of their spatial organization, be regarded as structural axes. Their mutual overlap, intersection, convergence form the frame nodes. Thus, linear binding structures define the nodes of the framework. The nodal structures are areas of the territory with the highest severity of ecological functions for the region, determining the natural specificity of the region. Structures are usually formed in places of mutual intersection or convergence of linear structures (at the confluence of rivers), or in conditions of high geo-energy potential (island systems, tectonic faults, mountain nodes).

On the territory of the Krasnoyarsk Territory, an example of such large nodal structures where natural reserves are created is the territory of the Putorana Plateau and the confluence of the Yenisei and Podkamennaya Tunguska rivers.

The mountain system of the Putorana Plateau (Putorana Plateau Online) has a great geo-energetic potential. Most of the rivers of the north of the Krasnoyarsk Territory originate here. The stability of the ecological situation covering the territories of the Lower Tunguska, Kheta and Khatanga and the lower flow of the Yenisei depends on the sustainability of the ecosystem of this large ecological node. In addition, the valley of Lake Ayan (the central part of the Putoran Plateau) is a huge ecological corridor of reindeer migration (from 300 thousand individuals), the number of which largely depends on the livelihoods of all the indigenous peoples of the North of the region. From the above, it can be concluded that the central part of the Putoran Plateau is a reserved core, requiring strict protection regime. A natural state reserve has been created here of international importance - Putoransky (Putorana Plateau. Online)

The Valdai National Park (Valdaysky National Park. Online) is located in the central part of the Valdai Upland - the main watershed of the Russian Plain and one of the main planetary watersheds. Valdai ridge - the source of the rivers of the Baltic, Black and Caspian seas. This is a global ecological node. But at the same time, this is the old mastered center of Russia, the landscapes here are natural and cultural.

In the Valdai National Park, areas where nature has retained its original appearance are the valuable forests of Baynevsky, Velievsky, and Seliger (Bajnevsky, Belevsky,

Seligersky woodlands. Online). They are not affected by economic activity, biogeocenotic relations are not broken or only slightly broken. They constitute the protected area of the national park.

In the case of national parks, formed on the basis of the European model (Astanin, 2017), it is characteristic to include reference areas in the reserve zone, where nature has retained its original appearance.

Vodlozersky National Park (Vodlozersky National Park. Online) is fully a part of the lake Vodlozero - river Ilexa. The lake-river basin is the upper, initial link in Europe's largest lake-river system Neva. The main watercourse of the Neva consists of the following sections: river Ilexa – lake Vodlozero - river Vodla - Lake Onega - river Svir - lake Ladozhskoe - river Neva. The lake-marsh systems of the national park are the last and the standard undisturbed complex of such size in Europe and play the most important role in maintaining a stable water balance of the Baltic catchment area. The reserve zone of the park is designed to preserve in its natural state reference forest-swamp complexes in the watershed areas (ecological corridors) of the Ileksariver.

The main structures, the spatial distribution of which determines the configuration of the reserve zone of the national park, are: nodes of the ecological framework that perform the environment-forming function and supporting biodiversity areas; transit territories or territories of ecological corridors supporting ecological connections between the cores; for national parks, formed according to the European model (Astanin, 2017), these are key and reference natural areas not affected by economic activity.

The reserve core of the park makes up a reserve zone together with a specially protected zone. In a specially protected area includes unique natural complexes with a high degree of vulnerability, but has long attracted tourists. A unique catchment area of the headwaters of the Polomet River is included in the specially protected zone of the Valdaisky National Park. This is a complete system, which is an ecological node and is the hydrological standard of small rivers. There is only one tourist route: Valdai-Moiseevichi-Palace-Valdai. Harvesting, harvesting, firewood is allowed.

The function of the specially protected zone of the Vodlozersky National Park is intended to preserve the most valuable natural complexes and landscapes of the park in its natural state and to organize regulated tourism. It includes territories north of Lake Vodlozero and the Kelka and S. Vodla rivers (Vodlozerskoe forestry), territories in the middle reaches of the Ileksa river (Ilekskoe and Pudozhskoye lesnichestvo), the upper reaches of Ileksa rivers and spurs of the Vetreny Belt ridge (Ilekskoye forestry). On the territory of the zone, movement of small groups of visitors is allowed, along specially laid ecological paths with fixed parking places, accompanied by a representative of the national park. In order to provide conditions for the development of tourism in the park on the territory of a specially protected area, recreational corridors have been allocated: along the river Ileksa, including the waters of the lakes Monastyrskoe, Thun, Luzskoe, Nelmozero, its tributaries Chusreki and Upper Okhtoma, along which the main water routes of the park are laid. The established width of the recreational corridor is 100 meters from each bank of a river or lake and, within a radius of 500 meters from specially equipped parking areas; along the old monastery track in the direction of Varishpelda-Kalakunda-Luza-Korkala-Calgachiha.

The Kutuk-Sumgan tract (The Tract Kutuk-Sumgan. Online) is located on the territory of a specially protected area, which, together with the protected area, form the

reserved core of the park of Bashkiria National Park (Bashkiria National Park. Online). A specially protected area is intended to preserve the most vulnerable and valuable ecosystems, a visit is possible only when accompanied by park staff. The Kutuk-Sumgan tract is a hydrogeological monument of nature, established in 1965 (“Kutuk” from the Bashkir language - “well”, “Sumgan” - “dived”). The Kutuk-Sumgan tract is located between the Belaya and Nugush rivers, 20-25 km east of the Nugush village. It is an intermontane depression, bounded from the west by the Yamantau Range, and from the east by the Kibiz Range. From the north and south, the basin is bounded by the canyon-shaped valleys of the Nugush and Belaya rivers.

In the tract identified and studied 40 caves. Part of the caves has glaciation. Thus, a part of the park's reserved core, along which historical tourist routes pass and objects of tourist attraction (natural monuments) are located, is part of a specially protected area.

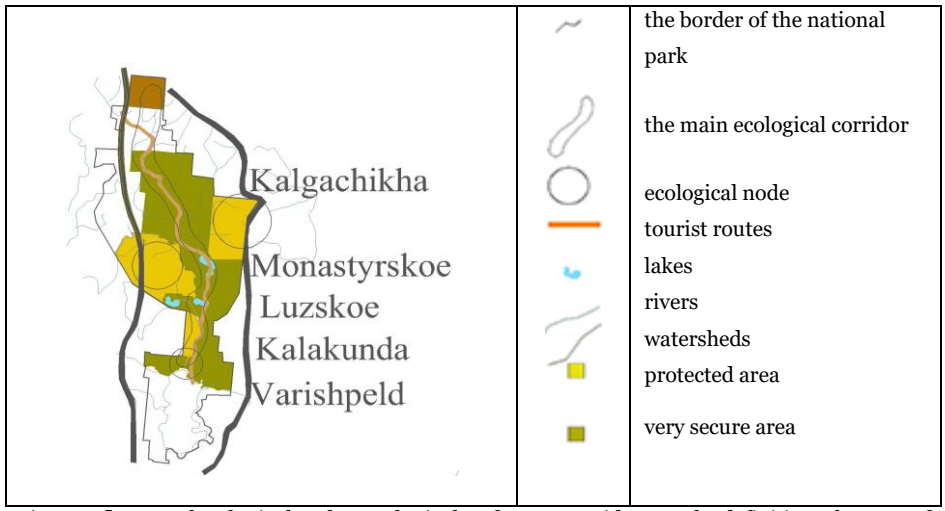
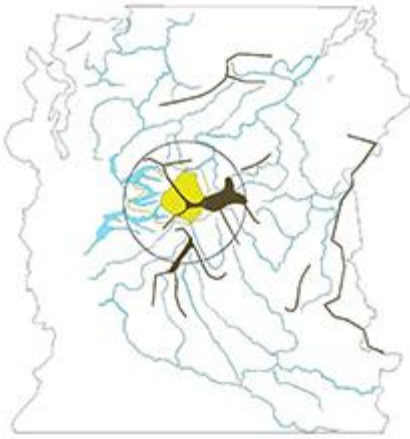


Fig. 1. Influence of ecological nodes, ecological and route corridors on the definition of protected and specially protected areas (on the example of the National Park of Vodlozersky)



	the territory of influence of Putoran ecological node
	Putoransky Nature Reserve and its protected area
	Putoransky ecological node

Fig. 2. The influence of the nodal structures of the ecological framework (ecological corridors - river valleys, watersheds) to the definition of protected areas (on the example of the Putorana Reserve (zapovednik)

Influence of the point structures of the ecological framework for determining the zone of educational tourism

The function of the zone of educational tourism is the organization of environmental education. The zone of educational, or eco-tourism includes the most popular routes for visitors and objects, which are also of great interest from an environmental education point of view. On the territory of the national park "Bashkiria" (Bashkiria National Park Online) there are 3 natural monuments. They are amazing in origin, unique as objects of nature, interesting for scientists and just beautiful.

The Kuperl Karst Bridge is a hydrogeological monument of nature, established in 1965 ("Kuperlya", literally from the Bashkir language, "with a bridge"). Located in the park, 4 km from the former farm Savka. The natural bridge spread across the canyon-shaped valley of the Kuperlya River, the right tributary of the Nugush River. Kuperlinsky bridge is the remnant of the roof of an ancient cave, and it was formed during the development of karst processes. The river Kuperlya, disappearing in the underground channel 3-4 km from the hamlet Savka, began to flow underground and develop the cave as a result of dissolution and erosion (Astanin, 2017).

The Bear Glade is a botanical natural monument, established in 1985 specifically for the protection of the species of the onion-oblique plant (Allium obliquum L). Squash - a vulnerable look. This is an ancient plant that has an isolated relic range in the Southern Urals. The nature monuments of the Bashkortostan's Bear Glade National Park and the Kuperl Karst Bridge are located on the territory of the educational tourism zone, where conditions are created for the preservation of natural landscapes and peace for the

wildlife. Regulated tourism and recreation are allowed here. The territory of the zone is 42% of the park (Astanin, 2017).

From an environmental education point of view, observation of animals is of great interest. The most suitable places for this are the migration routes of animals and their habitats. For example, in the national parks of Orlovskoe Polesye and Belovezhskaya Pushcha (Białowieża Forest. Online), routes and observation points for European bison were organized during the migrations. In the South Kamchatka Zakaznik (Yuzhno-Kamchatsky wildlife reserve. Online) they observe Lake Nerkoy going to spawn on the river.

Based on the analysis, it can be concluded that the zone of educational tourism consists of: - for wildlife - territories of ecological corridors representing the migration routes of animals and their habitats (Astanin, 2017) - for non-living - territories of nature monuments (geological, hydrological, etc.).

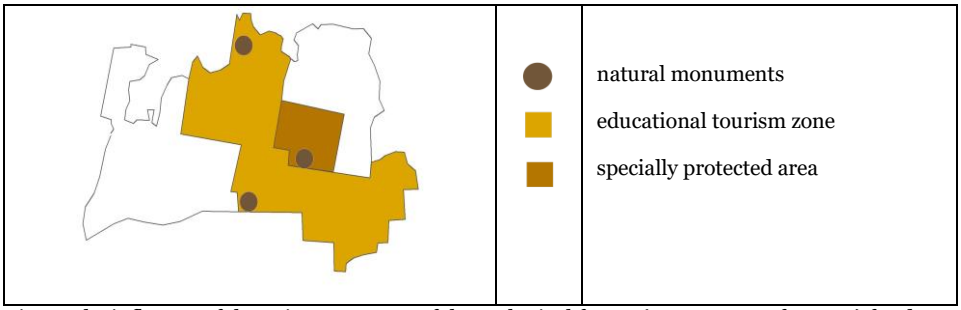


Fig. 3. The influence of the point structures of the ecological frame (monuments of nature) for determining the zone of educational tourism (on the example of the Bashkiria National Park)

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The zone of protection of historical and cultural sites is mainly allocated in parks formed according to the European model (Astanin, 2017). Its main function is to provide conditions for the preservation of historical and cultural sites. Monuments of archaeology, history, and culture, including places where significant events took place or prominent figures of science and culture, usually belong to the collection of historical and cultural sites of the national park. The territories of concentration of historical and cultural objects, depending on their importance, determine the configuration of the zone of protection of historical and cultural objects.

The Kenozersky National Park (Kenozersky National Park. Online) is included in the UNESCO World Network of Biosphere Reserves and is included in the catalog "Key ornithological territories of international importance in European Russia" (Key ornithological territories of international importance in European Russia. Online). The Kenozersky National Park (Kenozersky National Park. Online) is a reference system for the historical human habitat, an object that preserves the centuries-old history and culture of the Russian North.

The Kenozersky National Park is an example of an organic combination of material and spiritual culture with the environment. Preserved nature, historical and cultural monuments, traditional crafts make the park a mecca for tourists. The combination of the northern taiga massifs with a dense network of lakes of glacial origin make the reserve unique in beauty. They harmoniously fit into the local landscape and villages with old houses, painted shutters and carved balconies, numerous wooden temples - authentic masterpieces of folk architecture. Kenozerye - a museum of Russian wooden architecture in the open in a natural landscape, numbering up to 60 religious buildings. Moreover, all the chapels are located in a complex with sacred groves - the remnants of untouched forest that have come down to us since the times of paganism. The territory of concentration of cultural and historical sites is concentrated around the lakes Kenozero and Lakshmiozero. This territory is a zone for the protection of cultural landscapes (Astanin, 2017).

The Russian development of Vodlozero (Vodlozersky National Park. Online) is associated with the discovery of a trade route from Veliky Novgorod to the White Sea, where Lake Vodlozero served as an important transit point. It was a transport hub of historical trade

and development routes. On its coast and islands settlements arose. The zone of protection of historical and cultural sites is allocated in the north-eastern part of Lake Vodlozero, with the inclusion of the islands of Small Kolgostrov, Kolgostrov, Kanzanovolok. Here, on the basis of the unique architectural and landscape complexes of the historical villages of Vodlozero: Kanzanovolok, Koskosalma, Kolgostrov and religious buildings of the Ilyinsky Pogost, the park's museum complex should be formed, preserving, restoring and reconstructing (lost) monuments of architecture and other objects of cultural heritage in their natural cultural environment, with the return to the last of their traditional economic and cultural functions. So the restoration of Ilyinsky Pogost led to the establishment of the feast day of Ilyin Day here since 1995. This event became the starting point of the spiritual rebirth of the region. Chapel festivals began to revive, chapels were restored and built, worship crosses were established, a new Orthodox church was built in the village of Kuganavolok. Since 2004, the parish has been operating. In December of 2006, by the decision of the Holy Synod of the Russian Orthodox Church, a monastery was established at the Ilinsky Pogost - the St. Illyinian deserts of Vodlozero. Historical settlements also require restoration. During the 20th century, their number decreased from 40 to 5. The territory of the junction of historical paths, where historical settlements and cultural monuments are concentrated, require preservation and restoration, and is a zone of protection of historical and cultural sites of the Vodlozersky national park.

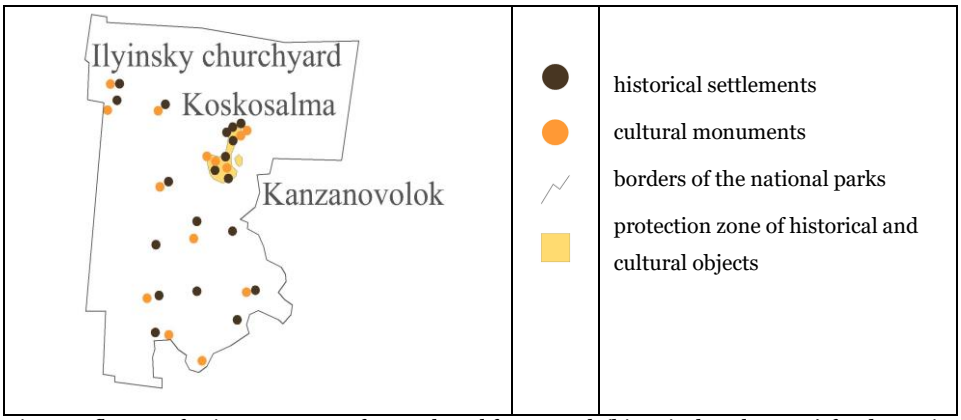

Fig. 4. Influence of point structures of eco-cultural framework (historical settlements) for determining the zone of protection of cultural and historical sites (on the example of the southern part of the Vodlozersky National Park)

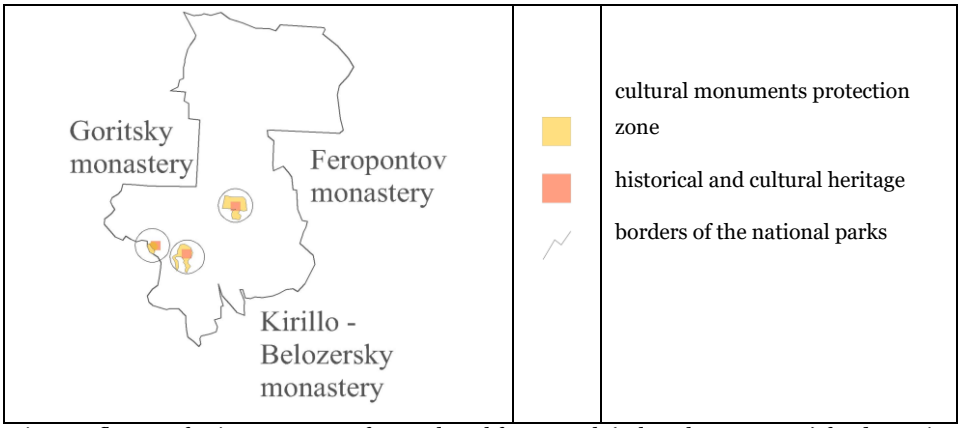

Fig. 5. Influence of point structures of eco-cultural framework (cultural monuments) for determining the zone of protection of cultural and historical sites (on the example of the Russian North National Park)

Influence of tourist routes and tourist attraction objects on the definition of a recreational zone and tourist service area

The territories that are the most recreationally attractive, with a great variety of landscape, the most favourable climate regime, high recreational capacity, a network of established tourist routes are recreational and tourist areas (Zabaikalsky National Park. Online). The main function of the recreation zone is to create conditions for recreation in a natural setting.

The recreational and tourist zone of the Ergaki nature park (Ergaki. Online) occupies 49.9% of the park's territory. It is open to visitors and organized tourism. This area is most attractive for recreational use due to the high concentration of tourist attraction objects and, accordingly, the existing tourist routes.

The centre of the tourist pilgrimage is the Artist's Pass, with a wide panorama of the Bird, Star, Tooth of the Dragon, Cone, Parabola and the Mountain Spirits and Artists lakes (Astanin, 2017). This allows you to organize radial, annular and loopback routes from the main tourist bases, which are characterized by the following types of building - detached wooden houses, 2-storey cottages and buildings for 20-40 places. Their location on the Buybinsky Pass, i.e., on the watershed of the rivers, makes it possible to organize linear routes - rafting along the Oya, Us, Amyl rivers, from the Gornaya Oya and Zolotoy Us campsites to the villages of Bolshaya Rechka, Verkhny Kuzhebar, Ust- Golden Hiking and ski trips along the Aradan, Oi, Mirsky ridges, Kulumys and Ergaki ridges were organized.

The configuration of the recreation zone is determined by: - historically established tourist routes; - objects of tourist attraction; - areas with favourable bioclimate and landscape diversity.

In some areas of the national park, located in its planning nodes (most often, they are confined to settlements and recreation facilities), a visitor service zone is created, the main function of which is the placement of tourist service facilities (Astanin, 2017). Planning nodes are recreational framework nodes. Several tourist routes originate here. The

territories of tourist service areas are within walking distance of tourist attraction places and have a high recreational attractiveness (favourable bioclimate and great landscape diversity). Thus, recreational areas and tourist service areas are associated. If the recreational zone is represented by tourist routes and objects of tourist attraction, then the tourist service area is their key elements.

An example is the Zabaikalsky National Park (Zabaikalsky National Park. Online). The zone of regulated recreational and economic use occupies the southern part of the Barguzinsky Range from the Bolshoy Chivyrkuy River, the middle part of the Svyatoi Nos Peninsula, the Chivyrkuisky and Barguzinsky Bays. It allowed tourist and limited economic activities, construction of recreational facilities.

Routes mainly pass through the recreational zone, and in the picturesque bays of the Chevyrkuisky and Barguzinsky bays there are places for tourist sites for several tourist routes and fishing, equipped with winter quarters and floating hotels. In the service area of visitors, on sites of the territory such as Glinka, Bolshoi Chivyrkuy and Monakhovo, which have been used by people for a long time, construction of small points of tourist service is envisaged. They represent several tourist service areas. The basic planning point of the Trans-Baikal National Park is the village of Ust-Barguzin.

For parks formed by the American model (Astanin, 2017), the location of tourist service areas near natural attractions and outside settlements is typical. The Orlovskoye Polesye National Park (Orlovskoye Polesye National Park Online) was established to preserve natural complexes and historical and cultural monuments in the south of the Non-Black Earth Region of Central Russia. The park is located in a unique place, which is inextricably linked with Russian epic stories about Ilya Muromets and Nightingale the Robber, as well as with the famous Turgenev's Hunter's Notes. This is a national park, formed according to the European model (Astanin, 2017). The main natural attractions are its picturesque lakes and springs, each of which has its own name and history.

Tours of the park acquaint with the main sights of Polesie: "holy sources", Lgovskoychurch, lakes Ryasnik, Staroye, Obmezh, ancient settlement 1 thousand BC. e., Barrow burial ground Radovishche. The main tourist establishments are the hotel complexes “Forester's House” in the village of Radovishche, “Orlovskoe Polesye” by Tsentralnoye Lake and the houses of rural residents in the village of Zhudre. Trinity dances, the Day of the Icon of the Kazan Mother of God, Christmas, Maslenitsa, Baptism are traditionally celebrated here. Tourist service areas are associated with the villages and villages of Lgov, Zhudere, Staroye, Trubechina, Radovishche. These settlements are located in close proximity to tourist attractions.

For parks formed according to the European model (Astanin, 2017), the location of tourist service areas is based on the historically established system of settlement. The location of the tourist service area is affected by: - planning nodes (points of intersection and convergence of tourist routes); - point structures (objects of tourist attraction).

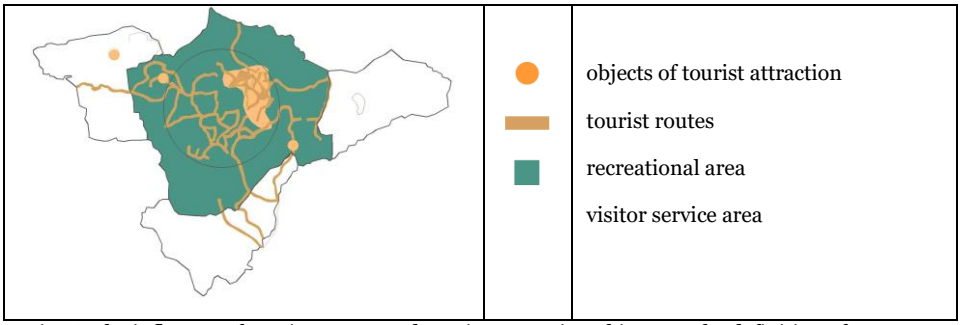

Fig. 6. The influence of tourist routes and tourist attraction objects on the definition of a recreational zone (on the example of the Ergaki Natural Park)

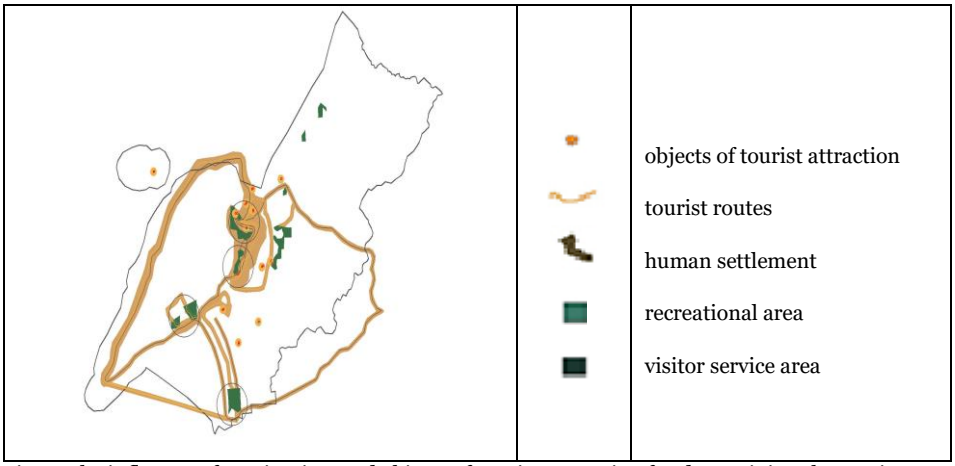

Fig. 7. The influence of tourist sites and objects of tourist attraction for determining the service area of visitors (on the example of the Zabaikalsky National Park)

The influence of the ethno-economic areas and populated areas of the indigenous people to determine the zone of traditional environmental management

In national parks located in areas inhabited by the indigenous population, zones of traditional nature management can be distinguished. They should be confined to the actual ethno-economic areas. The main function of these zones is the maintenance of sustainable environmental management, the development of folk crafts and crafts, and the preservation of the appearance of established cultural landscapes.

Western Sayan - a place of mixing of many cultures and ethnic groups. Natural Park Yergakiis surrounded by three settlements in which the indigenous people of Sayan live. The park's activities are tripartite: preserving nature, preserving the cultural traditions of the population, the relationship between nature and man. To this end, in each of the settlements (the village of Verkhneusinskoe, the village of Tanzybey, the village of Aradan), at the initiative of the park, public councils were organized. The purpose of the councils is to ensure the participation of residents of the village in making decisions related to the socio-economic development of the park, taking into account environmental legislation, the revitalization of cultural activities and folk traditions. For the most complete implementation

of this goal, a traditional nature management zone has been created in the nature park, which occupies 31.7% of the park's territory.

The territory of this zone is allocated in places of traditional environmental management of the local population. The traditional nature management zone consists of 2 clusters:

1. Ambuk - the territory of 49,400 hectares (settlement Tanzybey);

2. Us - the territory of 59,130 hectares (Aradan village, Verkhneusinskoe village).

In this zone, the local population is allowed to carry out traditional economic activities: harvesting food forest resources, medicinal herbs; hunt for registered one-time licenses issued in agreement with the Directorate of the park; sport and recreational fishing.

The park is equipped with an ecological path of the Siberian hunter. This is a path leading to a special world, according to the laws of which even now people live whose hunting is hunting. This route coincides with the real hunting path. There is a trail through subalpine meadows - the favourite places of ungulates and bears. In the middle of the route there is a real hunting cabin.

In addition to hunting, the traditional crafts of the local population are gathering wild plants. For the residents of the villages of Aradan and the village of Verkhneusinskoe, the collection of lingonberries and pine nuts is traditional, for the residents of the village of Tanzybey - the collection of blueberries and lingonberries.

The configuration of traditional nature management is determined by: ethno-economic areas (in the Ergaki park - gathering of wild-growing plants); ethno-economic ways (hunting ways); ethno-economic objects (hunting huts).

The traditional nature management zone of the Vodlozersky National Park (Vodlozersky National Park. Online) is designed to preserve the system of traditional environmental management of local residents, preserve and revitalize ethnic traditions and implement the strategy for the socio-economic revival of Vodlozero. This zone includes the ancient cultural region of the Russian North, where rare natural-historical landscapes, archaeological and wooden architecture monuments, a network of ancient settlements with elements of historical buildings and strong ethnic traditions have been preserved.

It is necessary to return their traditional economic and cultural functions. On the territory of the zone it is allowed: traditional hunting and fishing; the revival of traditional peasant farms, carrying out agrotechnical measures aimed at restoring grasslands and pastures overgrown with low forests; the restoration of the now abandoned old villages on the basis of the revival of the traditional way of life and nature management; placement of recreational centres with a deurbanized nature of the planning structure.

From the foregoing, it can be concluded that the territories of the zones of traditional environmental management occupy the ethno-economic area and are associated with parks established by the American model (Astanin, 2017), or include historically established settlements of the indigenous population. Ethno-economic area includes traditional economic ways and objects.

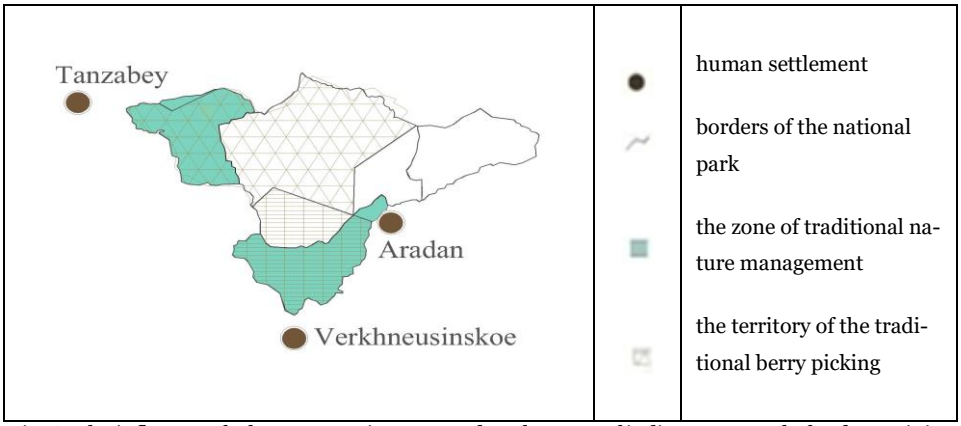

Fig. 8. The influence of ethno-economic areas and settlements of indigenous people for determining the zone of traditional environmental management (on the example of Ergaki Nature Park)

Impact of the road network on the definition of the zone of economic purpose

The economic zone is designed to carry out the economic activities of the park and ensure the livelihoods of citizens living in the national park. Land of the Leopard National Park (Land of the Leopard Online) was created on April 5, 2012. The zone of economic purpose is allocated in its territory (76,861 hectares). The zone includes a subzone of deer farms. It includes areas of reindeer herding within the state federal zoological reserve Leopard. Here, the reserve regime is preserved taking into account the needs of landowners for the targeted use of the deer farms Bezverkhovsky (2399 hectares) and Sandy (5857 hectares), while ensuring the safety of leopards.

The subzone of agricultural, residential and infrastructural purposes includes lands of peasant farms, as well as lands of municipal formations occupied under settlements. All types of economic activities that have been approved in the prescribed manner, taking into account the regulatory conditions of the national park, are allowed. Here are located tourist facilities for exploring the sights of the park, the organization of environmental education. In the village of Barabash, which is a part of the economic zone, there is a park visitor centre, where excursions along the 2.5 km long ecological path with two observation platforms are held. Construction in the zone is carried out in accordance with the national park development project.

The special-purpose subzone includes the sites of the Ministry of Defense and the FSB: Barabashsky Military Forestry of the Ministry of Defense of Russia (12,413 hectares), the Bamburovsky Polygon of the Pacific Fleet (153 hectares) and the polygon in the Pchelnik valley and the Kamyshovaya River (870 hectares). The reserve regime is preserved here, taking into account landowners' requirements for the targeted use of land.

The composition of the national park Vodlozersky (Vodlozersky National Park. Online) includes economic and forestry zones. The first cluster of the economic zone of the Vodlozersky national park includes lands of the settlements of the Kuganovolok rural administration, with the main industrial and communal economic core in the village of Kuganovolk. The functional orientation of the zone lies in the harmonious development of settlements, production and infrastructure nodes in the protected natural environment of the park.

The second cluster is the forestry zone, which is intended for reforestation, improvement of the condition of forests and enhancement of their aesthetic and recreational properties. The zone is located in the western part of the national park (Pudozhskoye Forestry).

For the implementation of economic activity necessary transport accessibility of the economic zone. In the Land of the Leopard National Park through the two sections of the zone passes the transport highway, in the Vodlozersky National Park to each cluster of the zone is suitable road.

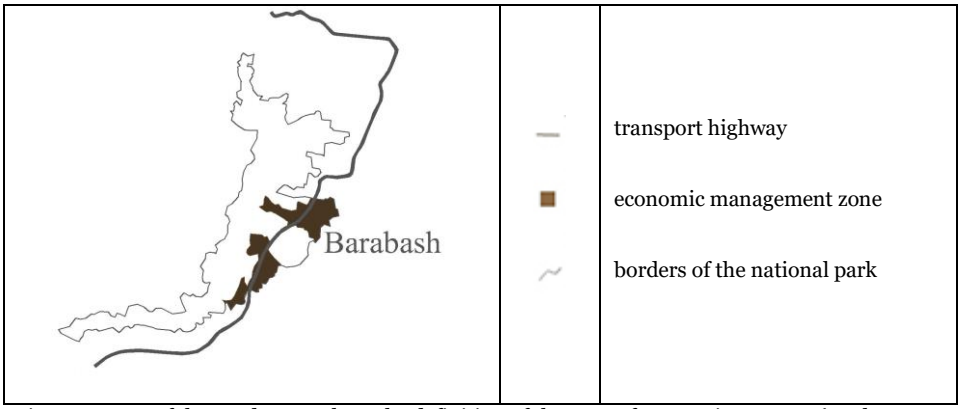

Fig. 9. Impact of the road network on the definition of the zone of economic purpose (on the example of the Land of the Leopard National Park)

The impact of the road network on the definition of the protection zone

Although the protection zone around the territory of the national park is by and large not the object of functional zoning, but in most cases it is included in the plan of its territorial administration. In the Land of the Leopard National Park, it covers 82 thousand hectares of the habitats of the Amur tiger and the Far Eastern leopard in the territories of the Khasan and Nadezhdensky districts and the Ussuriysk district of PrimorskyKrai adjacent to the national park. Specially protected territory is bordered by hunting and forestry. Therefore, a buffer zone is needed in which specials. the mode will mitigate the impact of human activity on the red book predators and ungulates, which are the objects of their food. The protection zone regime imposes the following restrictions: - hunting takes place without the use of traps and carpets in the presence of a specially trained person; - the presence of dogs is prohibited; - each hunting user is obliged to conduct biotechnical activities in the designated areas. For ungulates it is required to create feeding places.

In the security zone it is necessary to carry out fire prevention measures. The protection zone regime does not apply to the territories of populated areas and the 500-meter zone around them, to the territory of horticultural and dacha societies formed in accordance with the current legislation. The protection zone of the National Park of Leopard Land (Land of the Leopard. Online) is limited to settlements and transport routes.

In accordance with the Federal Law of March 14, 1995 No. 33 of the Federal Law "On Specially Protected Natural Territories (Section 3, Article 12, paragraph 7) and the Resolution of the Government of the Republic of Karelia of 06.07.2007 No. 102-p" On the Approval of the Territorial the planning of the Republic of Karelia (Section 4.7), a

protection zone should be created in the Vodlozersky National Park (Vodlozersky National Park. Online), in the areas adjacent to the park, in order to protect it from adverse anthropogenic influences.

Allocation of the protection zone is necessary to reduce the effects of logging and hurricane winds on the natural complexes of the park. Hurricane winds, which came from the felling of the Pyalm forest industry, caused massive windfalls. As a result, this caused an outbreak of the bark beetle-surveyor, who damaged not only dead, but also living trees. A dry forest has formed in the park, which has worsened the recreational attractiveness of the park. Based on the basin principle, the boundaries of the protection zone should be drawn up taking into account the main watersheds of the basin of Lake Vodlozero and the River Ileksa. This will not disturb the harmony of the existing landscape and preserve biodiversity in the national park. The protection zone is planned to be located in the Pudozh, Medvezhiegorsk, Segezha districts of the Republic of Karelia. The boundaries of the parks' protection zone are determined both by natural limiters - watershed ridges, and infrastructural objects - local dogs and traffic arteries.

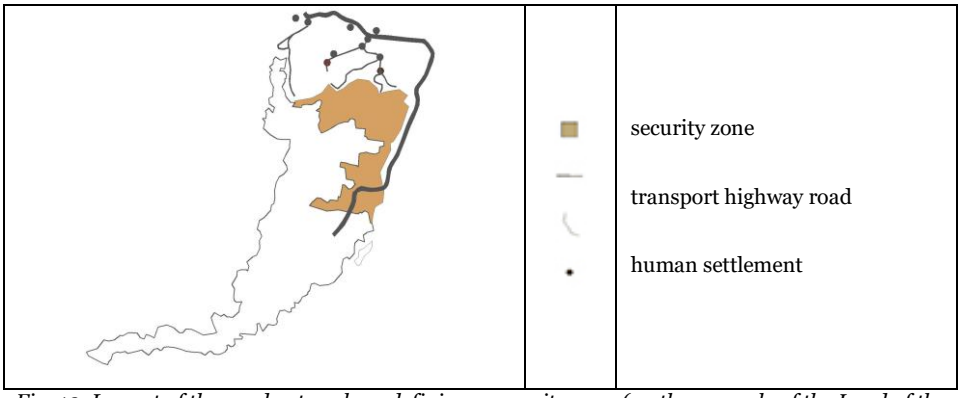

Fig. 10. Impact of the road network on defining a security zone (on the example of the Land of the Leopard National Park)

Territorial structures that influence on the formation of functional zones of special protected natural areas

As can be seen from Table 1, areal, linear and point territorial structures determine the configuration of zones (Polyan, 1999). They are the components of specialized frames. The term "frame" means "skeleton", "the base of something in the form of a skeleton" (Yakovleva, 2013). The frame method allows you to fasten the individual parts of the region into a single unit, and this increases their potential.

Tab. 1. Territorial structures that influence on the formation of functional zones of special protected natural areas

Zones/Structures	**Areal**		**Linear**	**Point**
Conservation core; conservation area (zapovedniki); Specially protected natural area	Reference natural complexes	Eco-nodes territories	Important eco-corridors; Tourist routes	Objects of tourist attraction; monuments of nature
Zone of protection of historical and cultural sites	Historical cultural landscape; concentration areas of monuments of history and culture	Knots of historical paths	Historical paths	Cultural monuments; historical settlements
Cognitive tourism zone		-	Migratory paths of animals	Monuments of nature; animal habitats
Recreation area	Territories favorable on bioclimate; with high landscape diversity	-	Historical tourist routes	Objects of tourist attraction
Visitor area	Territories favorable on bioclimate; with high landscape diversity	Knots of convergence of tourist routes	Transport; water; walking paths	Settlements; Recreation facilities
The zone of traditional nature	Ethno-economic areas	-	-	Indigenous settlements
Commercial	Area of the Territory, necessary for business activities	-	Transport routes	Settlements
Security area adjacent to the protected areas	Adjacent to the protected areas (SPNA)	-	Watersheds, Transportation routes	-

The essence of the frame approach in territorial planning is the modelling and design of territorial frameworks as spatial combinations of the most valuable elements of the territorial structure of a region. Frame systems are based on the allocation of various compositional, functional and planning elements. These include:

1. Areas - regions of resource concentration;
2. The axes are linear structures connecting the ranges into a single territorial frame;
3. Kernels - intersection nodes, high density of linear structures;
4. Loci - point elements of the functional-planning structure.

Manifesting and interacting in a certain area, composition types form a frame system. According to N. N. Baransky, the territory is completely comprehensible, by analysing its framework. It means that at the analytical stage of acquaintance with the region and further - when justifying project proposals, territorial frameworks may be the primary models of spatial development of the region. The concept of a natural (natural-ecological, ecological) framework came into domestic scientific vocabulary in the late 1970s and early 1990s, and it emerged in the field of urban planning, as an ecological antipode of planning, urban planning and settlement structures. At present, the ecological frame of a region or territory should be understood as a "system of natural "wild" and cultural landscapes, built on the basis of large reserves connected by ecological corridors, polarly distanced from centres, and axes of human economic impact, and ensuring the ecological stability of the territory of the corresponding level". Areal elements of the ecological framework - reserves and other specially protected natural territories - ensure the long-term functioning of ecosystems. Linear elements - ecological corridors (channels and floodplains of large rivers, valleys of small rivers, watersheds) - maintain the integrity of the framework. The point elements of the ecological frame are separate unique phenomena and objects of nature. The elementary components of the ecological framework have mostly linear forms, the territories of high density of linear elements form the nodes of the ecological framework.

The nodes of the ecological framework (Gerasimov, 2006; Voronov & Narbut, 2013; Voropaeva, 2011; Myrzagalieva, 2015; Parsunkova, 1999; Yamashkin & Zarubin, 2017), the most important ecological corridors, the most vulnerable natural monuments determine the location and configuration of the protected core of the territory - a protected and specially protected area. The remaining point elements of eco-tourism - monuments of nature, animal habitats - are part of the zone of educational tourism. Watersheds (ecological corridors) are the natural boundaries of the protected area of protected areas. Isolation of the reserve core is the first and most important stage in the design of functional zoning, it determines the territories on which sustainable development and the biological diversity of the environment depend.

National parks, formed according to the European model (Astanin, 2017), are basically formed on a natural-cultural landscape. The cultural frame also has a spatial organization. According to K.A. Pavlov, this is a model of a nuclear geosystem where nuclei, communication paths, and also field structures — zones of influence and distribution of certain cultural elements — are distinguished. A. S. Kuskov says that in addition to heritage territories playing the role of cores of cultural heritage with a certain area and elements of linear distribution playing a connecting role, local heritage sites are also distinguished. All these elements are connected in the form of a crystal lattice.

For protected areas, where eco-tourism is developing, the most important task is the development of cultural synergy and the natural component. Therefore, it is necessary to analyse the eco-cultural framework (Titova, 2013). Eco-cultural framework is built onethno-economic areas of sustainable development, achieved on the implementation of the experience of generations on the transformation and rational use of the environment in the process of mastering nature by man, the ways of disseminating elements of ecological culture and local cultural heritage that make up a whole with nature.

Areas of the historical cultural landscape, where cultural and historical monuments are concentrated, historical settlements located in the natural environment and in unity with the natural environment, individual cultural and historical monuments that cannot exist without the natural component of the landscape, historical paths for the development of nature cultural sites. Settlements of the indigenous population and their ethno-economic areas form the zone of traditional nature management.

The natural recreational framework (Nazarov & Frolova, 2012; Samoilova & Gordienko, 2017) is the basis for spatial planning of eco-tourism. The natural-recreational framework is a complex integrated map, which reveals recreational zones and areas (the territory most favourable for the development of recreation and tourism in bioclimate and landscape diversity), planning nodes, landscape-route corridors connecting them into a single territorial framework and separate objects of tourist attraction.

All these spatial structures have a decisive influence on the formation of recreational zones. In the nodes of landscape route corridors (tourist routes), tourist service areas are created. The most vulnerable and important for sustainable development natural complexes, which were previously attributed to the protected core of the territory, but having tourist attraction objects and established tourist routes, belong to a specially protected area.

Especially protected natural territories, developing ecological tourism, are exposed to little-altered natural territories, most of which are polarly distanced from the settlement system. Therefore, the transport frame plays an important role in planning ecological tourism (Yakovlev, 2009). The transport frame has an axial base, represented by transport routes of various rank, the intersections of which form transport junctions. Areal structure of the transport frame in relation to tourism is the transport accessibility of the territory. Transport accessibility is a prerequisite for the development of an economic zone and a service zone for visitors.

Discussion

Negative aspects of tourism and recreation in terms of ecology (Farrell & Runyan, 1991) can be summarized in one sentence: tourism requires large expenditures of energy, depletes resources, causes harmful emissions and increased waste. Therefore, from the beginning of the 80s of the last century, ecotourism (Tisdell & Wen, 2007; Blamey, 2001) is one of the priority types of travel - tourism, the purpose of which is to protect nature. This suggests the phenomenon of ecotourism - as a special sector of the tourist area, its growth rate is 2-3 times higher than the corresponding rate in the entire tourism industry.

One of the main conditions of ecotourism is the creation of infrastructure, aimed not only at satisfying comfortable rest, but at preserving the natural environment,

concentrating on authentic, on national peculiarities. These factors require the development of a targeted, regulated formation of eco-tourist space. Therefore, the stated theme needs the development of a scientific, systemic and integrated approach aimed at creating recreational zones based on the concept of sustainable environmental development that meets international standards and is able to respond flexibly and adequately to changing social, economic conditions and increasing demands on quality of the environment.

Zoning of national parks (Oyuungehrehl, 2011; Walpole, Goodwin & Ward, 2001; Wezel & Jauneau, 2001; Whitelaw, King & Tolkach, 2014; Xu et al, 2014; Zachrisson et al, 2006) is carried out in order to preserve the most valuable and vulnerable areas of natural ecosystems and create conditions for the development of eco-tourism, recreation and environmental education. It follows that the main tasks (Kameeva, 2017; Kovyazin et al., 2013; Chizhova, 2006; Wu et al, 2015) of zoning are: a) the preservation of the most valuable areas of natural ecosystems (Vehn, 2010; Guanshehn, 2000; Buckley, 2009) using the organization of the reserve and specially protected area; b) the preservation of cultural property in the territory of the zones of protection of cultural and historical sites; c) the development of ecological tourism and recreation on the territory of the zones of educational tourism and recreation; d) development of environmental education in the territory of the service are as visitors. The functional zoning of national parks as a design and planning process is aimed at solving the problems of creating a differentiated planning structure and regulating the flow of visitors in order to reduce the anthropogenic impact on natural complexes and cultural and historical objects of the park.

Conclusions

Structural and functional modelling, as an integral part of system modelling, reveals the relationship between the structure and functions of an urban object. The principle of the structural and functional approach to modelling urban planning systems is the functional decomposition of the system. The functional decomposition of the urban planning system consists in the hierarchical division of functions into the main (preservation of natural and cultural heritage) and subordinate main (recreational use of the territory) and additional (service of visitors and territories). On the basis of the functional decomposition of the system, interconnected territorial geosystems are distinguished, the elements of which affect the performance of conservation functions (ecological, eco-cultural) and recreational use (natural and recreational) and a subsystem performing a service function (transport). These natural and natural-anthropogenic territorial subsystems have a heterogeneous spatial distribution. The most significant elements of the systems are concentrated in territorial frameworks. The framework approach in modelling allows you to identify the most valuable areas of the territory.

The main structural elements of territorial frameworks are areas (zones), lines (axes) and loci. The main structural elements, manifesting and interacting in a certain territory, form derived structural elements - the cores and nodes of the territorial framework (territories of resource concentration), the configuration of the zonal elements of the planning structure of the territory is determined by the derived elements of the territorial frameworks: ecological, cultural, natural-recreational and transport. The analysis of the above frameworks can serve as a basic method for the study of the primary determination of functional areas of protected territories that develop eco-tourism. Since each functional area

has a certain set of planning elements, the definition of functional areas is the basis for further urban planning of ecotourism territories. Impact on the location of functional areas have: ecological frame - reserved, specially protected zone, zone of educational tourism, protected zone; eco-cultural frame - a zone of protection of historical and cultural objects, a zone of traditional nature management; natural recreational framework - recreational zone, visitor service zone, specially protected zone; transport frame - an economic zone and a service zone for visitors.

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References

Andrianov, V. A. (2012). Formation of transport infrastructure of the Russian sector of the Arctic in the XXI century. *Arctic and North, 9*, 118–139.

Astanin, D. M. (2017). The American model of ecological tourism - minimization of environmental impact and related planning aspects. *Architecton: Proceedings of Higher Education, 4*(60).

Astanin, D. M. (2017). The European model of environmental tourism - preservation of traditional culture and its impact on the planning of recreational areas. *Architecton: Proceedings of Higher Education, 3*(59).

Baranskiy, N. N. (1980). *Scientific problems of geography*. Moscow.

Basanet, L. (2002). Russian protected areas of Russia as part of the world ecotourism system. *E-Paper Series, 3*.

Bennett, G. (2004). *Integrating Biodiversity Conservation and Sustainable Use: Lessons Learned from Ecological Networks*. International Union for Conservation of Nature (IUCN).

Blamey, R. K. (2001). *Principles of ecotourism*. In The Encyclopedia of Ecotourism (pp. 5-22). Cabi Publishing.

Buckley, R. (2009). Evaluating the net effects of ecotourism on the environment: a framework, first assessment and future research. *Journal of Sustainable Tourism, 17*(6), 643-672.

Butler, R., & Boyd, S. W. (2000). *Tourism and national parks* (1st ed). Wiley.

Buzmakov, S. A., & Gatina E. L. (2009). Zoning of especially protected Osinskaya Lesnaya Dacha natural territory. *Geographical Bulletin, 1*, 51–55.

Chibileva, V. P. (2004). *Natural ecological framework of the Orenburg region and its role in promoting the recreational* potential [PhD dissertation, Orenburg].

Chizhova, V. P. (2006). Methods of zoning of national parks. South-Russian *Journal of Geology, Geography and Global Energy, 3*, 105–123.

Davey, A. G. (1998). *National System Planning for Protected Areas*. International Union for Conservation of Nature (IUCN).

Eagles, P. F. J., & McCool, S. F. (2002). *Tourism in National Parks and Protected Areas: Planning and Management*. CABI.

Farrell, B. H., & Runyan, D. (1991). Ecology and Tourism. *Annals of Tourism Research, 18*(1), 26–40. https://doi.org/10.1016/0160-7383(91)90037-C

Font, R. A. (2000). Mass Tourism and the Demand for Protected Natural Areas: A Travel Cost Approach. *Journal of Environmental Economics and Management, 39*(1), 97-116.

Gatina, E. L. (2013). Zoning of specially protected natural area of regional importance. *Anthropogenic transformation of the natural environment, 1*, 53–59.

Gerasimov, A. P. (2006). *Landscape approach in formation of ecological framework of the region* [PhD dissertation, Perm State University].

Guanshehn, C. (2000). Ecotourism and its role in preserving the environment of protected natural areas: the example of Changbaishan nature reserve, Jilin province, China. PhD dissertation. Moscow. http://zapovednoe-podlemorye.ru/territory/zabnatpark/

Kameeva, K. V. (2017). *Zoning protected areas of regional significance*. In The contributions of young scientists to agricultural science (pp. 36–39).

Kolbovskiy, E. Y. (1999). Cultural landscape and ecological organization of the regions on the example of the upper Volga region [PhD dissertation, Yaroslavl].

Kovyazin, V. F., Vymmer, A. S. & Karandej, M. G. (2013). Zoning of territory of the Russian Arctic reserve. *Current problems of Humanities and Natural Sciences, 11*(1), 60–67.

Kuskov, A. S. (2005). *Recreational geography*. Flinta.

Li, W., Ge, X., & Liu, C. (2005). Hiking trails and tourism impact assessment in protected area Jiuzhaigou Biosphere Reserve, China. *Environmental Monitoring and Assessment, 108*, 279–293.

Liu, C. J., & Pechacek, P. (2013) Current trends of ecotourism in China's nature reserves: A review of the Chinese literature. *Tourism Management Perspectives, 7*, 16–24. https://doi.org/10.1016/j.tmp.2013.03.001

Mose, I. (2007). *Protected Areas and Regional Development in Europe: Towards a New Model for the 21st Century*. Rotledge.

Myrzagalieva, Z. Z. (2015). *Ecological corridors as elements of the ecological framework of the territory*. International scientific-practical conference: in 2 parts. Peoples' Friendship University of Russia.

Nazarov, N. N., & Frolova, I. V. (2012). Natural and recreational potential of coastal geosystems of reservoirs as elements of the recreational framework of the city. *Geographical Bulletin, 22*, 4–13.

Oyuungehrehl, B. (2011) *Eco-geographical basis for the functioning and prospects of development of specially protected natural areas of Northern Mongolia* [PhD dissertation, University of Ulan-Ude].

Parsunkova, S. A. (1999). The Revival of the philosophy of Buddhism and the ecological framework of a territory – the strategy of nature management of the Republic of Kalmykia. *Scientific works of scientists and specialists of the Republic of Kalmykia*, 42–45.

Parsunkova, S. A., & Sohina, E. M. (1996). Ecological framework of a territory – the basis for the identification of natural and cultural-historical sites of Kalmykia. *Scientific works of scientists and specialists of the Republic of Kalmykia*, 236–238.

Polyan, P. M. (1999). *Territorial structure – Urban settlement: theoretical approaches and methods of studying*. Moscow.

Samoilova, N. V., & Gordienko, V. A. (2017). The use of natural reserves in the creation of the natural recreational framework in the village of Lazarevskoye. Spaces of urban civilization: ideas, problems, concepts, 109–112.

Smit, D. (2010, September 27). The Tract Kutuk-Sumgan. https://djonsmit.livejournal.com/19699.html
Stoyashcheva, N. V. (2005). Environmental framework of the territory and optimization of nature management in the South of Western Siberia [PhD dissertation, Barnaul].
Tisdell, C. A., & Wen, J. J. (2007). *Tourism and China's Development-Policies, Regional Economic Growth & Ecotourism*. World Scientific.
Titova, O. V. (2013). Ecological and cultural framework of the Vologda region. Current problems of Humanities and *Natural Sciences, 9*, 280–283.
Titova, O. V. (2014). Evaluation of specially protected natural areas as part of the regional ecological and cultural framework [PhD dissertation, Moscow].
Vedenin, A., & Kuleshova, M. E. (2004). *Cultural landscape as a heritage site*. Moscow.
Vehn, I. (2010). Principles of ecotourism planning in the North-West of the PRC [PhD dissertation, Sankt-Petersburg].
Voronov, B. A., & Narbut, N. A. (2013). The ecological framework of a territory and its system properties. *Geography and natural resources, 3*, 171–177.
Voropaeva, T. V. (2011). Methodological features of designing the ecological framework of the territory. Scientific notes of the Trans-Baikal State University. *Biological Sciences, 1*, 49–55.
Walpole, M. J., Goodwin, H. J., & Ward, K. G. (2001). Pricing Policy for Tourism in Protected Areas: lessons from Komodo National Park, Indonesia. *Conservation Biology, 15*(1), 218–227.
Wezel, A., & Jauneau, J. C. (2001). Agroecology – Interpretations, Approaches and Their Links to Nature Conservation, Rural Development and Ecotourism. *Agroecology and Strategies for Climate Change*, 17–33.
Whitelaw, P. A., King, B., & Tolkach, D. (2014). Protected areas, conservation and tourism – financing the sustainable dream. *Journal of Sustainable Tourism, 22*(4), 584-603. https://doi.org/10.1080/09669582.2013.873445
Wu, W., Zhang, X., Yang, Z., Qin, W., Wang, F., & Wang, C. (2015). Ecotourism Suitability and Zoning from the Tourist Perspective: a Nature Reserve Case Study. *Polish Journal of Environmental Studies, 24*(6), 2683–2697. https://doi.org/10.15244/pjoes/59422
Xu, H., Cui, Q., Sofield, T.& Li, T. (2014). Attaining harmony: Understanding the relationship between ecotourism and protected areas in China. *Journal of Sustainable Tourism, 22*(8), 1131-1150, https://doi.org/10.1080/09669582.2014.902064
Yakovlev, I. N. (2009). Transport framework the subject of the Russian Federation as an object of urban planning activities. *Transport construction, 2*, 2–4.
Yakovleva, S. I. (2013). Wireframe in the regional territorial planning schemes. *Pskov Region Studies Journal, 15*, 15-25.
Yamashkin, A. A., Yamashkin, S. A., & Zarubin, O. A. (2017). Landscape-ecological zoning and design ecological framework. *Theory and practice of harmonization of natural, social and production systems of the region. Proceedings of the International scientific and practical conference*, 214–222.
Yuzhno-Kamchatsky wildlife reserve. Retrieved from http://www.kronoki.ru/territory/southkam
Zachrisson, A., Sandell, K., Fredman, P., & Eckerberg, K. (2006). Tourism and protected areas: motives, actors and processes. *The International Journal of Biodiversity Science and Management, 2*(4), 350–358.

Zhong, L., Deng, J., & Xiang, B. (2008). Tourism development and the tourism area life-cycle model: A case study of Zhangjiajie National Forest Park, China. *Tourism Management, 29*(5), 841–856.