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Development of ecotourism infrastructure at protected areas of Primorsky Krai

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Abstract. The paper discusses the features of the formation of ecotourism infrastructure in specially protected natural areas (PAs) of the Primorsky Krai. The need for the research is due to the lack of basic strategies for the development of Primorsky Krai protected areas, the lack of developed route programs for various categories of visitors and weak infrastructure of ecological routes at protected territories of the Primorsky Krai. Research method: a comparative analysis of the landscape structure of protected areas in the Primorsky Krai and the world. As a result of the study, the location and boundaries of nature reserves, recreational territories, economic zones in each of the functional zoning schemes of the two protected territories “Leopard Land” and “Call of the Tiger” were identified and depicted. Nodal points of the considered landscapes located in tourist centers and nearby villages are highlighted. As a result of the study, it was concluded that the infrastructure for nature tourism should be a subject to the principles of sustainable development of territories, minimize the negative impact on nature and increase the safety and comfort of tourists.

Keywords: Specially protected natural areas (PAs), Ecological routes, Ecotourism infrastructure, Principles of landscape organization.

1 Introduction

With an increasing global population, there is growing demand for access to natural greenspaces for recreation. «The importance of such access is now widely recognized, for example in terms of improvements to physical and psychological health» (Weitowitz, Panter & 2 more [1]). Two intersecting trends of the times – a growth in demand for ecotourism services (by 20-30 % annually) and an increase in environmental protection (Kopeva, Ivanova [2]). Despite the growing popularity of eco-tourism in Russia, income from visits to protected areas in Russia is much lower than in other countries (Astaniin [3]). The main problems of the relatively low level of ecotourism development in Russia are the lack of basic tourism development strategies for protected areas, the lack of developed route programs for different categories of tourists, and the underdeveloped infrastructure (Sviatokha, Filimonova [4]).

Protected areas of Primorsky Krai include: 6 strict nature reserves, 4 national parks, 10 Habitat/Species Management Area, 1 Botanic Garden, 1 dendrological park, 1 nature park. There are 201 natural monuments on the territory of the Primorsky Krai (figure 1). Specially protected natural areas (PAs) occupy 16 % of the territory of the Primorsky Krai. Primorsky Krai has a high tourism potential but uses only 10 % of its capabilities (Bersenev, & 2 more [5]).



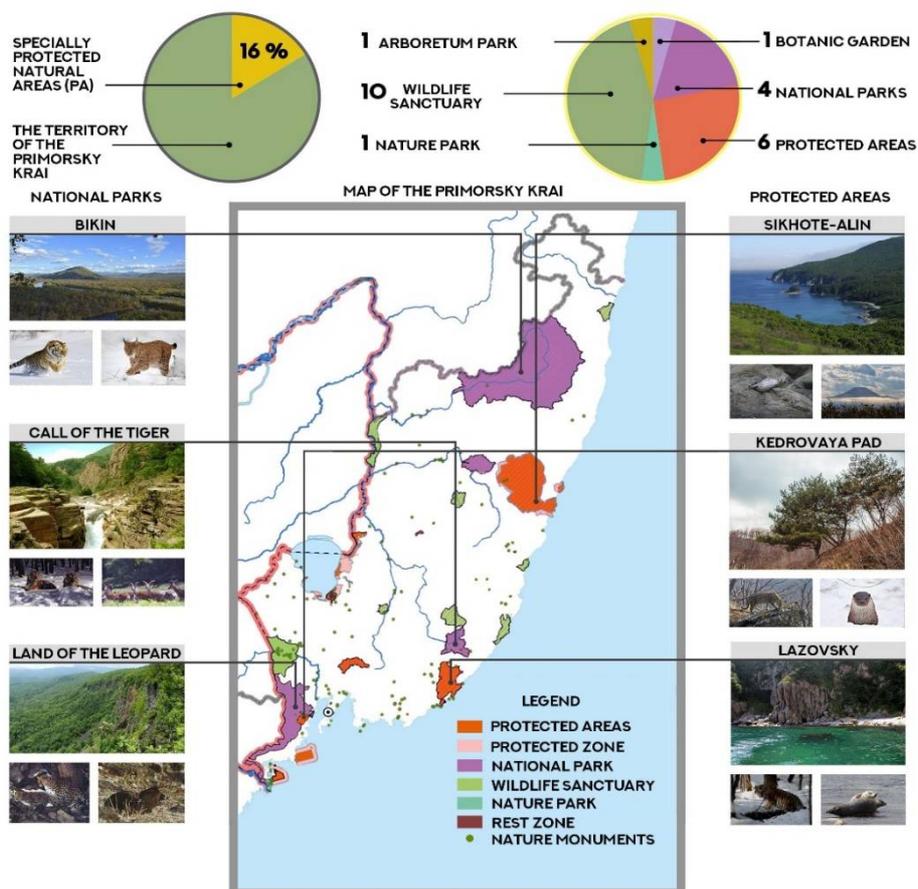


Figure 1. Specially protected natural areas (PAs) of the Primorsky Krai

The goal is to identify the principles of infrastructure development for ecotourism in protected areas. Tasks: comparison of functional zoning schemes of various protected areas in Russia and abroad, comparison of the saturation of their infrastructure, the quantity and quality of tourist routes, equipment of ecological trails.

At the stage of the problem formulating and determining its relationship with important scientific and social problems related to the protected areas development, an analysis was made of the works on the relevance of the environmental approach in the planning of protected areas (Fu & 2 more [6]; Yang, Li [7]; Young [8]) and protected area ecosystem management (Freemuth & 2 more [9]; Bryan, Raymond & 2 more [10]; developing environmental networks as the basis for environmental planning, natural resources management and sustainability PAs biodiversity (Jongman [11]; Porter Bolland & 2 more [12]).

A review of literary sources shows that a significant number of authors consider the landscapes of protected areas as a socio-ecological system and pay attention to issues of socio-economic development and legal restrictions. These works discuss the resolution of the conflict between the goals of protected areas management - the need to preserve existing natural values, and local interests - the need to integrate neighboring human communities into natural ecosystems and improve the lives of local people (Rescia, Willaarts & 2 more [13]; Smardon, Faust [14]; Kušová, Těšitel & 2 more [15], Zube [16]; Zube, Busch [17]; Abbasi Fletcher [18]; Orsi, Geneletti [19]).

A number of works are devoted to the study of the visual qualities of valuable landscapes of protected areas and methods for their assessment (Clay, Daniel [20]; Chamberlain, Meitner [21]; Store, Karjalainen & 3 more [22]). Aleksandra M Tomczyk and Marek W Ewertowski proposed a new system for assessing the status of ecological trails, which allows for the most effective monitoring of

the conditions of rest, increasing the safety of visitors and the effectiveness of environmental protection (Tomczyk, Ewertowski & 2 more [23]). Richard L Kent and Cynthia L Elliott found that scenic routes providing access to significant natural and cultural landmarks have environmental, social and practical value, and serve as a focus for planning green routes (Kent, Elliott [24]). Damiano C Weitowitz and Chris Panter discuss one of the infrastructure objects – parking lots and their distinctive features in the structure of protected areas (Weitowitz, Panter & 2 more [1]).

In this article, we pay attention to the features of landscape organization and functional zoning of protected areas. In this regard, the studies of Russian authors are of the most interest to us: the methodology for the formation of functional areas of protected areas for the development of ecological tourism proposed by Dmitry Astanin (Astanin [25]) and program for the ecotourism development at protected areas of the Primorsky Krai (Bersenev & 2 more [5]).

2 Methods

At the stage of collecting and examining the initial materials methods of observation and behavioral mapping, photo fixation, descriptions of functional and aesthetic object features were used. A comparative study of European and north-American models of natural parks was taken in the examination of world examples of landscape organization of natural parks. On the basis of these analysis landscape structure principles for a natural park of south part of Russian Far East were hypothesized. These results will become the basis for the authors further research and project elaboration for the one of the natural parks at Primorsky Krai.

3 Results and Discussion

Two protected areas of Primorsky Krai – “Land of the Leopard” and “Call of the Tiger,” were compared between each other and with several European and north-American national parks. The location and boundaries of the nature reserves, recreational territories, economic zones in each of the schemes of functional zoning of both parks are depicted on figure 2. There are five ecological routes in the Leopard Land protected area: *Leopard Trail*, *Leopard's Den*, *Semiverstka*, *To the Heart of the Cedar Plains*, *Steps of the Commandments*. There are four tourist routes in the Call of the Tiger protected area: *Mount Sister and Stone Brother*, *Cloud Mountain*, *Snow Mountain*, *Milogradovka River*. There are five ecological routes in the Lazovsky Nature reserve as the part of the *Call of the Tiger* protected area: *Tiger Trail*, *Island That Stopped Time*, *Breath of Spring*, *Stone Rhapsody*, *Through the Ages*. The most significant points of attraction in the *Leopard Land* protected area, along with numerous natural attractions, are 12 archeological monuments, 46 historical monuments, and a museum. In the Protected area *Call of the Tiger*, the attraction points for tourists are four mountains, a river and a waterfall on the river, two natural sites, several of these natural attractions have official status of natural monuments. The main visual boundaries of the considered protected areas are mountain ranges and individual peaks. Nodal points of the landscapes under consideration located in tourist centers and nearby villages are highlighted.

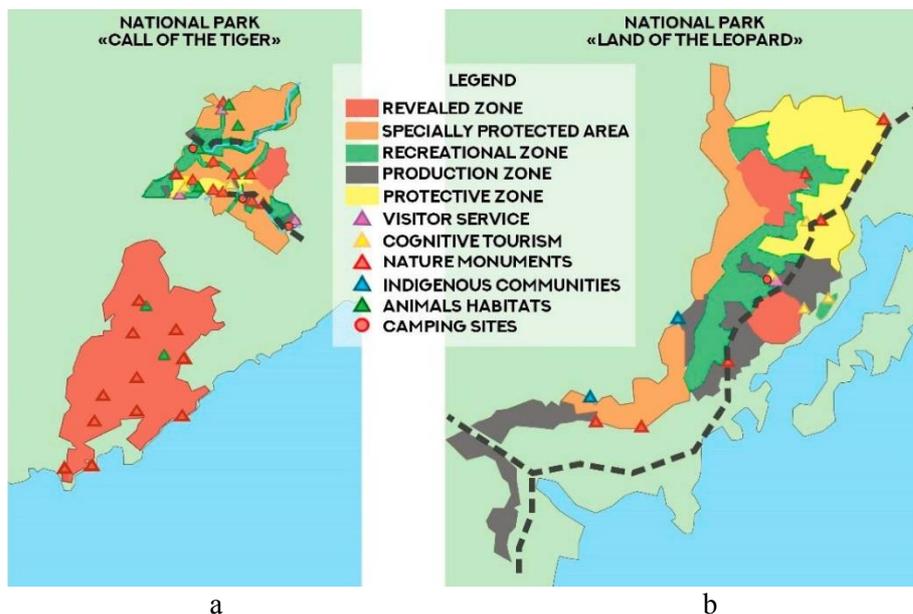


Figure 2. Functional zoning of specially protected natural areas: a – *Call of the Tiger*; b – *Land of the Leopard*.

The analysis of the territories of two protected areas *Land of the Leopard* and *Call of the Tiger* showed that the potential for the development of ecotourism here is very high: rare biological species live in these areas, unique plant communities and biocenoses grow, and unique objects of inanimate nature are located (geomorphological and hydrological objects), cultural, historical, paleontological and archaeological sites are localized. The existing imbalance between the ever-increasing flow of unorganized tourists and the need to preserve the primordially of the natural environment can be overcome with the help of a range of legislative, social, economic, cultural and educational measures.

In responding to the ecotourism challenge, landscape architects and urban planners will need to hone their abilities to work with multidisciplinary teams and to converse productively about preservation and development ethics (Grenier, Kaae & 2 more [26]). The creation of the necessary tourist infrastructure and suitably equipped ecological routes in order to minimize environmental impact, to support environmental education and ensure a more safe and comfortable stay of tourists in protected areas should become an architectural and landscape measure on the way to the development of ecotourism.

As a result of comparing the functional zoning schemes of various protected areas in Russia and abroad, it was revealed that in the *Land of the Leopard* protected area the ratio of the recreational and reserved zones is comparable to foreign analogues, while in the *Call of the Tiger* protected area the recreational zones occupy a much smaller part of total area. It was shown that in the *Land of the Leopard* protected area, the saturation with service facilities is at an average level, while in the *Call of the Tiger* protected area, services are presented in a minimal assortment (table 1). It has been established that in both protected areas only a few ecological trails and tourist routes are organized, despite the spaciousness of the territory and the large number of natural, historical and cultural attractions. Equipment and improvement of hiking trails also needs to improve information content, aesthetics and environmental friendliness.

Table 1.

INFRASTRUCTURE	NATIONAL PARKS	YOSEMITE	GRAND CANYON	YELLOW-STONE	BAYERISCHER WALD	SAXON SWITZERLAND	BAIKAL	CALL OF THE TIGER	THE LAND OF THE LEOPARD
VISITOR CENTER	✓	✓	✓	✓	✓	✓	✓	✓	✓
HOTEL	✓	✓	✓	✓	✓	✓	✓	✓	✓
CAMPING	✓	✓	✓	✓	✓	✓	✓	✓	✓
HOSPITAL	✓	✓	✓						
FOOD-SERVICE	✓	✓	✓	✓	✓	✓	✓	✓	✓
STORES	✓	✓	✓	✓	✓	✓	✓		✓
PARKING	✓	✓	✓	✓	✓	✓	✓		✓
PUBLIC TRANSPORT	✓	✓	✓	✓	✓	✓			
BICYCLE RENTAL		✓	✓	✓	✓	✓			
PUBLIC SHOWERS		✓							
LAUNDRIES		✓							
WC	✓	✓	✓	✓	✓	✓	✓	✓	✓

4 Conclusion

As a result of a theoretical analysis of current trends in the formation of protected areas, it was determined that the design of infrastructure for nature-oriented tourism in protected areas should be carried out as part of the strategy for the formation of protected areas in general and should be subject to the following principles: sustainable development of the territory; minimization of negative impact on nature; improving the quality of infrastructure (safety and comfort for visitors). In a further study, it is necessary to find out the optimal ratio of protected, recreational and economic zones in protected areas Land of the Leopard and Call of the Tiger and, if necessary, adjust their borders. It is also necessary to explore the possibility of increasing the number and variety of ecological trails and tourist routes in these territories. When designing infrastructure for nature-oriented tourism in national parks, special attention should be paid to saturating with various service facilities, as well as equipment and improvement of hiking trails: to increase their information content, aesthetics and environmental friendliness.

References

- [1] Weitowitz D C, Panter, C, Hoskin, R and Liley D 2019 Parking provision at nature conservation sites and its implications for visitor use *Landsc. Urban Plan.* **190** 103597. DOI: 10.1016/J.LANDURBPLAN.2019.103597
- [2] Kopeva A V, Ivanova O G 2017 Tourist and recreational resources of the Primorsky Territory as the basis for the formation of tourist clusters *Archit. Build. Russ.* **1** (221) pp 67–76
- [3] Astanin D M 2019 Ecological and cultural aspects of the evolutionary development of models of ecological tourism *Cities* **2**(19) DOI: 10.18844/prosoc.v6i6.4465
- [4] Sviatokha N Y and Filimonova I Y 2015 Development of ecological tourism in protected natural areas of the orenburg region *Vestn. Orenbg. State Univ.* **10(185)** pp 420–423
- [5] Bersenev Y I, Tzoi B V and Yavnova N V 2006 Protected Areas of Pimorsky Krai, Vladivostok.
- [6] Fu X, Schock C and Stuckert T 2016 Ecological wisdom as benchmark in planning and design *Landsc. Urban Plan.* **155** pp 79–90. DOI: 10.1016/J.LANDURBPLAN.2016.06.012
- [7] Yang B and Li S 2016 Design with Nature: Ian McHarg's ecological wisdom as actionable and practical knowledge *Landsc. Urban Plan.* **155** pp 21–32 DOI: 10.1016/J.LANDURBPLAN.2016.04.010
- [8] Young R F 2016 Modernity, postmodernity, and ecological wisdom: Toward a new framework for landscape and urban planning *Landsc. Urban Plan.* **155** pp 91–99 DOI: 10.1016/J.LANDURBPLAN.2016.04.012
- [9] Freemuth J and McGregor Cawley R 1998 Science, expertise and the public: the politics of ecosystem management in the Greater Yellowstone ecosystem *Landsc. Urban Plan.* **40** pp 211–219. DOI: 10.1016/S0169-2046(97)00114-X

- [10] Bryan B A, Raymond C M, Crossman N D and Macdonald D.H 2010 Targeting the management of ecosystem services based on social values: Where, what, and how? *Landsc. Urban Plan.* **97** pp 111–122 DOI: 10.1016/J.LANDURBPLAN.2010.05.002
- [11] Jongman R H G 1995 Nature conservation planning in Europe: developing ecological networks *Landsc. Urban Plan.* **32** pp 169–183 DOI: 10.1016/0169-2046(95)00197-0
- [12] Porter Bolland L, Drew A P, Vergara-Tenorio, C 2006 Analysis of a natural resources management system in the Calakmul Biosphere Reserve *Landsc. Urban Plan.* **74** pp 223–241 DOI: 10.1016/J.LANDURBPLAN.2004.09.005
- [13] Rescia A J, Willaarts B A, Schmitz M F and Aguilera P A 2010 Changes in land uses and management in two Nature Reserves in Spain: Evaluating the social–ecological resilience of cultural landscapes *Landsc. Urban Plan.* **98** pp 26–35 DOI: 10.1016/J.LANDURBPLAN.2010.07.007
- [14] Smardon R C and Faust B B 2006 Introduction: international policy in the biosphere reserves of Mexico’s Yucatan peninsula *Landsc. Urban Plan.* **74** pp 160–192 DOI: 10.1016/J.LANDURBPLAN.2004.09.002
- [15] Kušová D, Těšitel J, Matějka K and Bartoš M 2008 Biosphere reserves—An attempt to form sustainable landscapes: A case study of three biosphere reserves in the Czech Republic *Landsc. Urban Plan.* **84** pp 38–51 DOI: 10.1016/J.LANDURBPLAN.2007.06.006
- [16] Zube E H 1986 local and extra-local perceptions of national parks and protected areas *Landsc. Urban Plan.* **13** pp 11–17 DOI: 10.1016/0169-2046(86)90003-4
- [17] Zube E H, Busch M L 1990 Park-people relationships: an international review *Landsc. Urban Plan.* **19** 117–131 DOI: 10.1016/0169-2046(90)90030-6
- [18] Abbasi Fletcher S 1990 Parks, protected areas and local populations: New international issues and imperatives *Landsc. Urban Plan.* **19** pp 197–201 DOI: 10.1016/0169-2046(90)90054-6
- [19] Orsi F, Geneletti D 2010 Identifying priority areas for Forest Landscape Restoration in Chiapas (Mexico): An operational approach combining ecological and socioeconomic criteria *Landsc. Urban Plan.* **94** pp 20–30 DOI: 10.1016/J.LANDURBPLAN.2009.07.014
- [20] Clay G R and Daniel T C 2000 Scenic landscape assessment: the effects of land management jurisdiction on public perception of scenic beauty *Landsc. Urban Plan.* **49** pp 1–13 DOI: 10.1016/S0169-2046(00)00055-4
- [21] Chamberlain B C and Meitner M J 2013 A route-based visibility analysis for landscape management *Landsc. Urban Plan.* **111** pp 13–24 DOI: 10.1016/J.LANDURBPLAN.2012.12.004
- [22] Store R, Karjalainen E, Haara A, Leskinen P and Nivala V 2015 Producing a sensitivity assessment method for visual forest landscapes *Landsc. Urban Plan.* **144** pp 128–141 DOI: 10.1016/J.LANDURBPLAN.2015.06.009
- [23] Tomczyk A M, Ewertowski M W, White P C L and Kasprzak L 2017 A new framework for prioritising decisions on recreational trail management *Landsc. Urban Plan.* **167** pp 1–13 DOI: 10.1016/J.LANDURBPLAN.2017.05.009
- [24] Kent R L and Elliott C L 1995 Scenic routes linking and protecting natural and cultural landscape features: a greenway skeleton *Landsc. Urban Plan.* **33** pp 341–355 DOI: 10.1016/0169-2046(94)02027-D
- [25] Astanin D M 2018 Methods of functional zoning of protected areas for development of ecological tourism. *Archit. Proc. High. Educ.* **3(63)**
- [26] Grenier D, Kaae B C, Miller M L and Mobley R W 1993 Ecotourism, landscape architecture and urban planning *Landsc. Urban Plan.* **25** pp 1–16 DOI: 10.1016/0169-2046(93)90119-X