System for Conservation of Specially Protected Natural Areas as Sustainable Urban Development Element

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Abstract. The article is devoted to the problem of the conservation of specially protected natural territories. The research topic is especially interesting for urban areas that provide sustainable urban development. The authors consider the main aspects of the sustainable settlement development and substantiate the direct dependence of the evolution of territories in the implementation of urban development activities with the ecological framework of a city. The object of the study is a specially protected natural area located in Western Siberia in the city of Tyumen, the Tyumen region. As a result of the analysis, the main problems of preservation of the nature monument of regional importance were revealed as well as a set of measures and management decisions regarding the conservation of the forest park.

1. Introduction

This article discusses the issue of conservation of specially protected natural areas. The urgency is caused by the lack of the necessary mechanism for preserving unique or standard biogeocenoses and creating an ecological framework that allows the natural complexes to function sustainably.

The research topic is of interest for the territory of settlements in order to ensure sustainable development of the territory.

Sustainable development of the city is the development of territories and settlements in the implementation of urban development in order to provide urban development with favorable living conditions for the population, including limiting the harmful impact of economic and other activities on the environment and its rational use in the interests of the present and future generations.

Aspects of sustainable development of the Charter of Sustainable Development of European Cities are:

1) sustainable development, as a creative search process, a balance that occurs at the city level;
2) the focus of the urban economy on sustainable development;
3) social equity for sustainable urban development;
4) sustainable land use planning;
5) reasonable planning of movement around the city;
6) local government as a precondition;
7) citizens are the main actors.
Ensuring sustainable development of the city requires an active, purposeful policy of the city authorities. This policy should be both realistic and effective.

2. **Factors of investment attractiveness of the city**
   One of the main factors of the investment attractiveness of our city, and the Tyumen region as a whole, is the geographical position. The proximity to the areas of the West Siberian oil and gas complex, the passage of the main transport communications that ensure its functioning and development of the northeastern regions of the Yamal-Nenets Autonomous District, the transit position on the transcontinental "West-East" direction, the access to the section of the state border of the Russian Federation with Kazakhstan Territorial advantages for the economic development of Tyumen and the Tyumen region.

   The climatic conditions of Tyumen are characterized by continental features. Here prevails a long and snowy winter and a short summer.

   The city of Tyumen is characterized by intensive growth, that is, the city is in a state where the total area of housing and the volume of public goods increases faster than the number of residents and jobs. This is due to the construction and expansion of the core enterprises and other factors that ensure the investment attractiveness of the city.

   In the Tyumen region a large number of valuable natural complexes of different status and protection regime. Their combination forms a system of specially protected natural areas, designed to preserve unique landscapes, diversity of animal and plant life.

   Specially protected natural areas belong to the objects of the national heritage and represent land, water surface and air space above them, where natural complexes and objects with special environmental, scientific, cultural, aesthetic, recreational and health value are located and decisions of the state authorities are completely or partially withdrawn from economic use, for which the specially protected - this definition gives the Land Code Rossiys oh Federation [1-4].

3. **The object of research is a monument of nature of regional significance**
   The object of the study is the "Lesopark Zatjumensky" in Tyumen, the oldest natural monument of regional significance (Figure 1).

   ![Figure 1. Map-scheme of the nature monument "Lesopark Zatjumensky".](image)

   The research pursues the goal of identifying the main problems of preserving the nature monument of regional importance "Lesopark Zatjumensky" and developing measures to address them.

   The forest park was created to preserve in natural state natural complexes and objects, including: landscape, vegetation (indigenous pine forests, steppe meadows), medicinal plants, rare and endangered species of animals and plants, protection of recreational resources. In addition to the
above, Zatyumensky is of particular importance for the "oxygen policy" of the city and in order to preserve biodiversity [5].

The area of the Forest Park is 77,193 hectares. Soils are sod-podzolic to a different degree of podzolization. The terrain is slightly crossed, the elevations are insignificant. The hydrological network is not developed.

On the territory of the Forest Park there is a former tree nursery with plantations of artificial origin. Prevail closed landscapes with horizontal closure of the canopy (mostly of the same age). In the stand, Scots pine prevails - 60% of the total wooded area, 40% of the birch is occupied by a pile. There is also a Siberian spruce and a hearth linden tree, included in the Red Book of the Tyumen region (planting in 2000), a forest park is a place for rest and walks of the townspeople.

The PA system developed in the region, despite the variety of facilities already established, can not provide protection for a number of valuable landscapes and habitats of rare species, including the Zatyumensky forest park [6,7].

4. Results of the study

According to the results of the research, the following problems of preservation of the nature monument of regional importance were found:

1) the Cable-air line passes through the territory of the park;
2) a high pressure gas pipeline 0.4 mPa is laid;
3) household waste is found throughout the forest park;
4) roads are observed;
5) fires are allowed in unidentified places.

According to the map of urban zoning (Figure 2), the territory of the forest park "Zatyumensky" refers to recreational areas, which means that the regulations for the use of this territory are violated [8,9].

![Figure 2](image)

**Figure 2** Fragment of the map of town-planning zoning of the city of Tyumen.

The solution of these problems can be a set of measures and management decisions regarding the conservation of the forest park "Zatyumensky", namely:

1. Transfer of the cable-air line, which will prevent loads on the ground and the destruction of the soil-vegetation layer.
2. Transport of the gas pipeline with a pressure of 0.4mpa, which will prevent the oppression of trees and shrubs, slowing down their growth, drying out and death, and also reduces the risk of explosion.
3. Clearing of garbage waste - will entail an improvement of the ecological situation in the Forest Park, maintaining its normal aesthetic appearance, morally will not allow the territory to continue to become dirty.
4. Dismantling of linear structures (asphalt paths) - will allow to preserve the soil vegetation layer.
5. To close the territory from the entrance of motor transport.
6. Creation of special squads from among active citizens, which will prevent violations of the special protection of objects and forest fires, timely detect negative processes and, as a consequence, prevent damage to the natural complex.

We will consider in the most detail two measures to eliminate problems that are the most urgent, since they have the greatest damage to the nature monument of the Zatyumensky Forest Park and contradict the current legislation [5,6]:
- transfer of cable-air line;
- transfer of the high pressure gas pipeline 0.4 mPa.

Figure 3 shows the project for transferring unauthorized objects.

![Figure 3](image)

**Figure 3** Proposals on the transfer of unauthorized objects in the forest park "Zatyumensky"

For the implementation of the project on the transfer of unauthorized sites from the territory of the monument of regional importance to the Zatyumensky Forest Park, financial costs are required, but the whole complex of measures taken helps to preserve the natural and aesthetic appearance, and also minimizes the negative impact on the flora and fauna of the forest park, including rare and endangered species of animals and plants located on the territory of the Zatyumensky Forest Park [10].

5. Conclusion

In 2015, the agency "ES GM" conducted a sustainable development rating of Russian cities in accordance with the principles of sustainable development of territories identified by international organizations and the scientific community. In total, the indicators of 179 cities of 80 subjects of the Russian Federation with a population of more than 100 thousand people (total in Russia 1112 cities) are estimated. The positions of municipalities in the rating are determined on the basis of 31 indicators that assess the three main areas of sustainable development: economic, environmental and social (including demographic) [11].

The purpose of the rating is to identify the leaders and outsiders of sustainable development among Russian cities to determine the potential for growth and increase their competitiveness.

Based on the results of the study, groups of leading and backward municipalities were identified.

So, the first place in the rating of sustainable development of cities was taken by Tyumen, followed by Surgut and Moscow (Figure 4).
Figure 4 Twenty cities of leaders of the sustainable development of cities (2015).

The growing concentration of industrial enterprises in urban areas, the uncontrolled increase in the scale of construction, the reduction in the share of recreational areas replaced by production zones and new lines of transport and utilities, have led to a disturbance of the balance of the man-made and natural environment. The larger and more comfortable cities become, the more resources they require from the environment and the higher the risk of irreparable damage to the natural environment. It is difficult for a person to realize that consumption of resources can be limited, that one must think about the needs of future generations.

References

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