

mapping framework of the geological environment; geoinformation provision, creation and maintenance of a database; the study and estimation of geological and natural-technogenic conditions and factors;

2) monitoring of subsurface area: organization of a system of monitoring regional – municipal level; monitoring within the existing industrial zones and sites of urban development (territorial and object level);

3) a complex of engineering-geological and geo-ecological mapping and research activities carried out consistently in the scale of: 1:50 000, 1: 25 000, 1:10 000.

The most important targets of the Concept: increase the level of protection of the population and engineering of the objects of various levels of responsibility the territory of the city of geological hazards; reliable prediction of places manifestations and timely warning of negative consequences from the geological processes and phenomena with minimum cost and with maximum economic, social and environmental effects.

The work is submitted to the International Scientific Conference «Ecology industrial regions of Russia», The United Kingdom (London), 20-27, October 2012, came to the editorial office on 13.09.2012.

ECOLOGICAL FRAME OF URBAN DISTRICT OF VORONEZH (RUSSIA)

¹Lisova O.S., ²Grigorevskaja A.Y.,
²Vladimirov D.R.

¹*Voronezh State Academy of Forestry and Technologies, Voronezh, e-mail: ospopova@yandex.ru;*

²*Voronezh State University Voronezh, e-mail: grigaya@mail.ru*

Present situation in urban areas planning in Russia doesn't satisfy requirements of urban agglomerations sustainable development. The main problem are standards of urban areas designing in last decades. The standards rely on the efficient functioning of the separate areas (industrial areas, residential areas), but not on urban area efficiency in whole. This is also typical for urban district of Voronezh. Conservation of biodiversity of cities may be possible if ecological frame will develop. Ecological frame is the sum of ecosystems with individual regimes of land use. The ecosystems create spatial-organized infrastructure which supports ecological sustainability of areas, prevent the loss of biodiversity and degradation of natural landscapes.

The city of Voronezh was founded in 1586 as an embattled city. For 426 years the city and its landscapes changed dramatically. Today we faced some serious problems: how to preserve and augment historical-cultural, biological, landscape and architectural-spatial originality of the city. The

problems may be solved by using designing city's ecological frame and its efficient work [3].

The master plan of the city was created in 1970. The plan determined the stage of a scientific approach using for urban landscapes creating. The approach based on a ratio of public areas (including green areas) and restricted areas. They have to form an integrated ecological system and become the most important factor of stabilization and improving of environmental conditions. Environmental and recreational functions of natural territorial complex are determined to be essential. Natural territorial complexes consist of green and protected areas. Out of all natural territorial complexes the most accessible for visiting are parks and public gardens. These areas are subjected to a great recreational pressure [7, 8].

Modern ecological frame of the city of Voronezh is a multistructural system. It integrates elements of different age, functional purposes and types of green infrastructure. Its node points are areas of selection and introduction of arboreal-shrub flora and protected areas of Voronezh [4, 5]; old public gardens and parks; relatively young urban gardens and parks; embankments, avenues and boulevards; gardens in residential areas; large cemeteries; woodlands within a city. These elements are the most important node points of Voronezh ecological frame map (figure). Their areas, position relative to industrial and residential areas and biodiversity help us to understand what kind of frame we have now and how we should develop it.

A detailed analysis of all the elements and their properties gave us a base for a critical assessment of the current state of the ecological frame. The main complains are: disunity of its component parts, disparity of their functional purpose, dilapidation and neglect of many node points of the ecological frame. The main ecological corridor in the city is Voronezh reservoir. The right bank of the reservoir is high and the left bank is low. A developed net of ecological corridors are typical only for north and central parts of urban district of Voronezh. All the rest parts of the city suffer from lack of relations with green areas of different categories of land use.

Currently we are working out new ways of improving properties of ecological corridors and developing city ecosystem of higher quality. In order to organize the high quality city ecosystem some legal, spatial and territorial, architectural and economic activities are needed. They are as followed:

- 1) creating of new recreational areas within the city;
- 2) rehabilitation and creation new parks instead of old and lost ones, especially in a new densely build-up areas;
- 3) conservation and development the existing public and restricted areas;
- 4) creating new green areas between motorways for each administrative district;

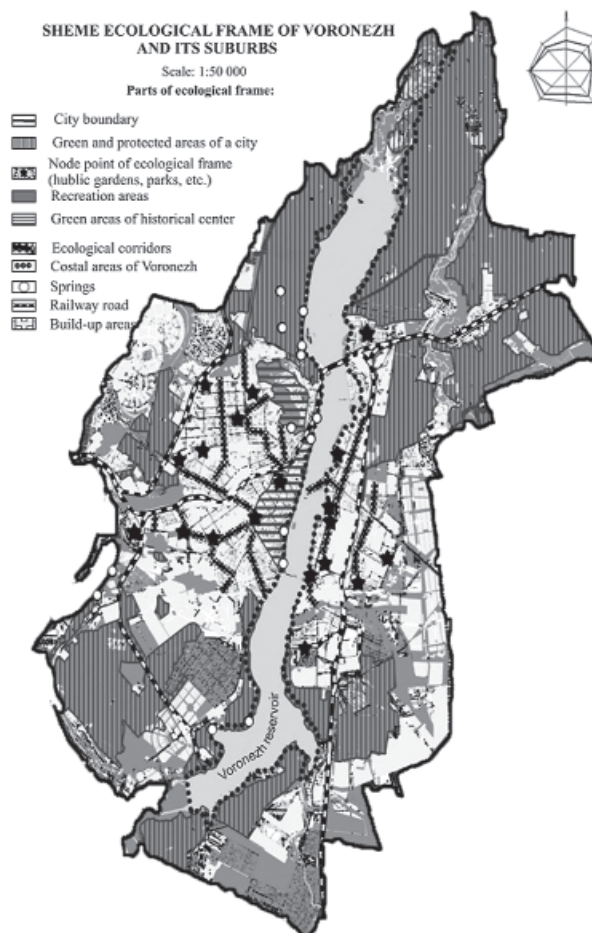
5) creating of «territorial links» in order to integrate central node points with reserve peripheral areas

6) revegetation and cultivation of regions which are difficult of access;

7) using of bridges, roofs of houses, fences etc. as a potential green corridors;

8) transformation of the Voronezh reservoir valley for recreation purpose;

9) creating new efficient mechanisms of cooperation between local authorities and dwellers [7]; environmental justice for ecological frame structure.



Some of developments were already tasted in action.

We collected information and materials for creating new ways of effective functioning of the ecological frame. The case studies in this field and a detailed forecast is only part of the project. For successful functioning the environmental frame needs to be methodically financed. Flexible environmental justice should also be created. In perspective we believe that public-private partnership in this area will develop successfully.

References

1. Georcina I. Landscape-geographical approach in cities ecological frame (case study Yaroslavl) 18,18 (2006).
2. Colobovski E. Landscape designing and creating of natural protected areas net (case study Khabarovsk) 152,152 (2001).

3. Grigorevskaia A. Green areas of Voronezh city as a natural element multistructural system of ecological frame 100-111,187 (2012).

4. Mashkin S. Vegetation of the L. Koganovich park in Voronezh 62, 243 (1939).

5. Mashkin S. The most interesting hardy-shrub exotic species which are growing in Voronezh 1-10, 211 (1939).

6. Petuhova I. Ecological frame as a mean of Yaroslavl's natural complex preservation 85-91, 193 (2004).

7. Prigoryanu O. Bio-geographical foundations of the ecological net in Orlovskaja oblast 23, 23 (2004).

8. Nabut N. Strategies for ecological frame formation of urban areas (case study Khabarovsk) 192, 192 (2002).

The work is submitted to the International Scientific Conference «Nature management and environment protection», France (Paris), 14-21 October 2012, came to the editorial office on 18.10.2012.