



## **Landscape approach to the formation of the ecological frame of Moscow**

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The territory of Moscow, in particular in its former borders, is distinct for its strong transformation of the natural properties of virtually all types of landscape complexes. The modern landscape structure is characterized by fragmentation of natural land cover. Natural and quasinatural (natural and anthropogenic) landscape complexes with preserved natural structure are represented by isolated areas and occupy small areas. During recent years landscape diversity in general and biodiversity in particular have been rapidly declining, and many of the natural landscape complexes are under ever-increasing degradation. Ecological balance is broken, and preserved natural landscapes are not able to maintain it. Effective territorial organization of Moscow and the rational use of its territory are impossible without taking into account the natural component of the city as well as the properties and potential of the landscape complexes that integrate all natural features in specific areas. The formation of the ecological framework of the city is particularly important. It should be a single system of interrelated and complementary components that make up a single environmental space: habitat-forming cores (junctions), ecological corridors and elements of environmental infrastructure. Systemic unity of the environmental framework can support the territorial ecological compensation where a break of the ecological functions of one part of the system is compensated by maintaining or restoring them in another part and contribute to the polarization of incompatible types of land use.

Habitat-forming cores should include as mandatory parts all the specifically protected natural areas (SPNAs), particularly valuable landscape complexes, as well as preserved adjacent forest areas. Their most important function should be to maintain resources and area reproducing abilities of landscapes, landscape diversity and biodiversity. Ecological corridors which perform environmental and operating transit functions should include unified landscape systems of river valleys, their hollow-beam upstreams and drained lows.

The most important elements of environmental infrastructure include the most valuable forest and wetland complexes, springs and other landscape and aquatic complexes, cultural and historical landscape complexes, landscape complexes with high concentration of cultural heritage sites, sites of natural and green areas with great potential of natural and recreational resources, natural and recreational parks, natural monuments. They can serve as centers of landscape and biological diversity and perform partial transit (migration) and buffer functions.

The territory of the ecological framework can be used for strictly regulated or limited recreation (tourism, short leisure). The adjacent natural and green spaces and natural parks may play a buffer role for the SPNAs and valuable landscape complexes.

The spatial pattern of the landscape complexes of Moscow allows to create a single ecological framework based on the landscape, distinct for its interrelated and complementary components. Its basis may be consisted of uniform landscape complexes of valley outwash plains and river valleys, their hollow-beam upstreams and drained lows which perform system forming, environmental and transit functions. In the plan river valleys and small erosional forms are as if enclosed in the gullies and constitute single paradynamic systems unified by lateral flows. Therefore not only the edges of river valleys, but also the rear seams of the valley outwash plains should become important natural boundaries, limiting urban development of the area. Their most important functional feature is that they serve as local collectors and surface water runoff channels. These landscape complexes are distinct for most dynamic natural processes and thus negative exogenous processes.

The authors have drawn indigenous (conditionally restored) and modern landscapes of Moscow on a scale of 1: 50,000 and on their basis an ecological framework map of Moscow. These maps are an important natural basis for the analysis of conditions and identification of limiting factors of the urban development of the big city.