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### **SYSTEMATIC TECHNIQUES OF AESTHETIC FEATURES EVALUATION OF THE TYUMEN REGION LANDSCAPE**

*SUMMARY.* This article provides a definition of landscape aesthetics and reveals the objectives of this research area. The relation between the concepts “landscape” and “paysage” is given. The justification of the allocation of landscape–paysage complexes using systematic method is conducted. Landscape–paysage complexes of the Pyshma River basin in Tyumen Region are identified. The standards of aesthetic appeal of the landscape–paysage complexes for this region are established on the basis of existing methods.

The estimation scale of aesthetic value of landscapes is represented. The article gives the main features of landscape structure in the territory of the Pyshma River basin in Tyumen Region and the aesthetic evaluation has been made. The aesthetic zoning is offered and application card, which gives an idea of the basic laws of landscape differentiation on aesthetic grounds, has been made. This kind of card can become the basis for planning recreational activities. Proposed typology of landscapes can be considered in the development of measures to optimize the use of the environmental resources.

*KEY WORDS.* Aesthetic appeal of the landscape, aesthetic geography, aesthetic zoning, attractiveness.

One of the promising areas of modern geography is the study of the aesthetic properties of the landscape. The issues of aesthetics of natural objects always interested people, but in the age of the strongest anthropogenic pressure on the area, the study of the landscape properties, that can meet the spiritual and aesthetic needs of people, is truly an important issue [1].

*Landscape aesthetics* is a special scientific field that studies the layout of the landscape as a specific type of a renewable natural resource that affects the psychological comfort of an individual.

The objectives of the landscape aesthetics are the study of the formation and characteristics of the space–time distribution of aesthetic resources, landscapes; classification and systematization of the landscape on the aesthetic appeal; the study of landscapes as the material basis of it in terms of aesthetic value; measurement and assessment of landscape aesthetics; preservation and cataloguing of the most beautiful and typical landscapes for future generations; the study of the psychological effects of landscape features on humans [2], [3].

Recently, the role of the aesthetic potential of the area assessment has grown, which may be considered at the level of an optimal decision-making that is related to

the conservation of environmental quality. When dealing with such issues, it is not an uncommon opinion that a particular object should be retained because of its aesthetic “uniqueness”. Currently, however, we need to think about saving typical, repetitive, “modest” landscapes, as they are the “cradle” of the primary aesthetic sense, in particular this can be applied to the territory of Tyumen region [4].

The theoretical and methodological basis of the study is viewed in the works by V.A. Nikolaev, L.I. Mukhina, M.Y. Frolova, K.I. Eringis, A.V. Belov, N.N. Nazarov, A.V. Bredikhin, D.A. Dirin, et al). The researchers propose conceptual framework and methodological development on the methods of aesthetic evaluation of landscapes, etc. The issues of the regional landscape assessment continue to be relevant. Each region should develop its own assessment tactics because the properties of different landscapes in natural complexes and their implications for humans are geographically specific.

The choice of the Pyshma River basin as the object of this study is determined by its diverse landscape structure, as well as the attractiveness and accessibility of the site for the population in the south of Tyumen Region in terms of recreation.

In the national geography the term *paysage* fixes the notion of the landscape layout. Besides, the geographic landscape is the material basis of the *paysage* [5]. Objectively, landscapes differ in terms of the ability to generate landscape views. For this reason, it is reasonable to distinguish landscape–*paysage* complexes and the landscape views will have some similarities, with an acceptance possible inner *paysage* diversity. Allocation of these complexes is the basis of *paysage* typing, their classification and mapping. This allows to move from the assessment of individual *paysages* in nature to the generalized assessment of the landscape image. Thus, not an isolated *paysage* is assessed but the landscape environment, its potential to generate certain types of *paysages*.

As well as geographic landscapes consist of objective components of the geographic environment (landforms, vegetation, waters, etc.), the landscape views are formed from specific elements of landscapes, that add to their composition. Here, as nowhere else, it is clearly seen the law of systems emergence, i.e. the integral is bigger than its aggregate. The assessment of the aesthetic potential of landscape–*paysage* complexes requires the use of systematic research method [2], [6].

The landscape–*paysage* complexes, distinguished in the Pishma River basin of Tyumen Region, are shown in Table 1 [7].

*Table 1*

**The landscape–*paysage* complexes of the Pyshma River basin of Tyumen Region**

#	A landscape– <i>paysage</i> complex
1.	Gently undulating reliefs of pine and birch forests with grass layer; blocking terrain
2.	Gently undulating reliefs of pine and blueberry-green moss forests with short grasses; blocking terrain
3.	Flat reliefs with pine and red bilberry-green moss forests; blocking terrain

4.	Flat reliefs with birch and sedge-bluejoint forests; poor seen terrain
5.	Lower areas, occupied by broken birch forests and pine-birch herb forests
6.	Flat reliefs of back marshes with pine-birch forests with grass layer; heaviness
7.	Flat reliefs of pine marshy forests; heaviness and poor seen terrain
8.	Gently undulating reliefs of pine-birch forests with grass layer; blocking terrain
9.	Gently undulating reliefs of pine-birch park-like forests
10.	Flat reliefs with pine-green moss forests with short grasses in combination with broken grass-bushy forests
11.	Flat reliefs with pine (or asp) forests with small grasses; blocking terrain
12.	Lower areas with marshy birch-sedge forests; heaviness
13.	Lower areas with gramineous-herbs-sedge meadows; wide view
14.	Flat reliefs with small grasses- green moss open forests in contrast with marshy grass-moss meadows in the lowlands
15.	Hummock-ridge bogs, bushy-sphagnum bogs (with rare forest stand), combined with well seen sedge-willow marshes along the lowlands
16.	Undulating surface with trees and shrubs; sufficient terrain tracking
17.	The main flood plain area is with gramineous-herbs meadows; good terrain tracking
18.	Flat lower areas with sedge-bluejoint meadows; good terrain tracking
19.	Drained areas with gramineous-herbs meadows; good terrain tracking and passability
20.	Flat reliefs with mixed pine-birch forests; blocking terrain
21.	Slopes and bottoms of gorges with herbs- gramineous plant stand and occasionally with thinned forest cover

To assess the aesthetic appeal of the landscape-paysage complexes a number of criteria is used [1], [6], [8]:

1. *Divergence of landscapes*—the degree of their differences due to their genesis and morphology. The contrast ratio is determined by taking into account the diversity of local components of the landscape geosystems, the ratio of their areas, color scheme, etc. The greatest divergence occurs in the so-called ecotones, i.e. the transition zones among adjacent landscapes. These areas are characterized by a special variety of constituent elements, which increases their attractiveness.

2. *The color scheme*. The theory of psychophysical influence of color on the organs of human feelings is elaborated. It can be successfully used in the analysis of the emotional disposition of landscapes. Warm colors (red, orange, yellow) are exciting and stimulating. Cool colors (blue, light blue, violet) are calming, pacifying. Green occupies an intermediate position—it is the color of emotional balance. Dark tones have depressive effects. It is known that in the early 20<sup>th</sup> century V.P. Semyonov-Tyan-Shansky detected optical complementary colors, especially decorating the landscape, i.e. the presence of spectacular displays of contrast against the overall color scheme [9-10].

3. *The depth and diversity of perspectives*. According to the depth of species prospects, three types of landscape composition are distinguished: the front composition, the volume composition and the deep-spatial composition. The front landscape composition is a characteristic for the monotonous paysages, almost without

the depth of perspective. For example, a paysage of a forest edge, when it is impossible to distinguish anything deep in a dense tree stand. The volume composition is a characteristic of the paysages with several structural plans. The deep-spatial composition is a characteristic for the landscapes with a deep perspective. As a rule, their terrains are well seen from the observation points, dominating the opening terrain [5].

4. *The presence of water reservoirs in the landscape structure, their quality and quantity* is one of the topological characteristics of the terrain. Water reservoirs do not only enrich the landscape and darken the color scheme, but create additional recreational opportunities and increase the attractiveness of landscapes in general.

5. *The role of the forest in the formation of a paysage.* From an aesthetic point of view, the forest is one of the most attractive complexes for people. The optimal forest cover is 30–60%, which enables to shape panoramas and provides for the best viewpoints. At the forest cover close to 100%, the attractiveness of the landscape decreases. Among the tree species, conifers—pine, spruce—have a greater aesthetic attractiveness. In addition, mixed forests of conifers and deciduous trees are characterized by high aesthetic qualities.

6. *The degree of anthropogenic transformation of the landscapes.* Initially, a landscape of an aesthetic value should be of a high degree of naturalness and of a low level of saturation with secondary elements. Unmodified natural landscape becomes rare; its value increases continuously while disappearance of the “white spots” and the availability of previously inaccessible places. Especially it is important for a city dweller, living in the environment of asphalt and concrete. City dwellers to the greatest extent are alienated from the vibrant, untouched nature and reunite with it at short-term moments of a country holiday.

Considering the aesthetic value of the paysages in terms of a significant anthropogenic transformation of landscapes, it is necessary to start out from the concept of *cultural landscape*. The cultural landscape is understood as a harmonious, balanced interaction between a human and nature, where nature and people come into contact with each other through a variety of cultural and ecological ways of life. A genuine cultural landscape always meets high aesthetic demands [6].

7. *The presence of symbolic objects in the landscapes*, i.e. natural and cultural sights, an official (although officially they may not have this status) also contribute to the aesthetics of the area (fountains, chapels, temples, etc.).

To rank the landscape–paysage complexes according to their aesthetic value, the author developed estimation scales for each of the selected criteria (see Table 2). On these scales the obtained values are recalculated into evaluation categories (points). Thus, partial estimates (separately for each selected criterion) are obtained. The final general estimate for the landscape is developed upon the integration of the partial estimates. Some of the paysage characteristics of the landscape positively influence its aesthetic properties only up to a certain limit, after which their further development, on the contrary, reduces the attractiveness (see criterion 5) [6], [9].

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Table 2

## The estimation scale of the paysage–aesthetic value of the landscapes

#	The estimates of aesthetic appeal of the landscape		Points
1.	Landscape contrast ratio—diversity of the complexes with different structure and composition (SCC)	The landscape consists of 1–2 SCC	1
		There are 2–4 SCC under space advantage of 1–2	2
		The landscape contains more than 4 SCC with the prevalence of 3–4	3
		Equal percentage of the areas of more than 5 SCC	2
2.	The landscape color scheme	Black, dark grey	0
		Light grey, brown, straw-colored	1
		Light blue, green	2
		Light blue, green with contrast occurrences (optical complementary colors) of yellow, white, orange, and red	3
3.	The depth of the perspective	The front perspective	1
		The volume perspective	2
		The deep-spatial perspective	3
4.	The presence of water bodies in the landscape structure, their quality and quantity	Missing	0
		Lakes (clean/polluted)	1/-1
		Rivers (clean/polluted, with littered banks)	1/-1
5.	Forest cover, %	0	0
		1–15	1
		16–30	2
		30–60	3
		61–85	2
		>85	1
6.	The degree of anthropogenic transformation of the landscapes	Nominally unchanged landscape	3
		True cultural landscape	2
		Marginally changed landscape	1
		Damaged landscape	-3
7.	The presence of symbolic objects in the landscapes	Missing	0
		Present	1

Table 3 displays the ranking scale of integrated estimations by the grade of aesthetic value. In total, 4 categories are allocated.

Table 3

## The ranking scale of integrated estimations by the grade of aesthetic value

The value grade	Aesthetic value estimation	Points
I	The most valuable paysages	15–20

II	High-value paysages	10–14
III	Mid-value paysages	5–9
IV	Low-value paysages	1–4

To assess subjective (emotional) perception of paysages, the methods of expert assessments and opinion poll were used [1], [2], [6].

Basing on the landscape–paysage map, taking into account the estimation results, we have compiled an application card (Figure 1), which provides an overview of the basic laws of differentiation of the landscape of the Pyshma River basin according to its aesthetic grounds. This kind of card could be the basis for planning outdoor activities. In addition, the proposed typology of landscapes could be considered in the development of measures to optimize the use of environmental resources.

On the whole, the analysis revealed direct relations between the obtained estimation results by the evaluation criteria and the opinion of experts and respondents on the landscape attractiveness of the studied area.

As the result of the aesthetic value estimation of the landscape–paysage complexes for the selected criteria, it turned that the valley landscapes have the greatest landscape and aesthetic potential. They are characterized by a high expressiveness of the relief, considerable spatial diversity of vegetation, a good passability and terrain tracking, the availability of attractive and accessible for recreation banks, etc. The landscape–paysage complexes of the forests with meadow vegetation also have a high aesthetic grade. These groups of tracts have an aesthetic view due to a gently undulating, steeply sloping topography, combined with vegetation, which has a multi-tiered and contrast detection (i.e. the combination of woodland and meadow clearings). Pyshma pine woods are of particular aesthetic importance. They are located on the crest of gently undulating surfaces, taken by lichens, combined with cranberry-green moss of pine forests. This category also includes the broken birch park forests on the undulating surfaces of watersheds and terraces.

The swamped areas are the least attractive from an aesthetic point of view. They are distinguished by monotony, uniformity and unfavorable color scheme (brown, green, rusty-brown shades), rare stand of trees, often oppressed vegetation. Observers have the feelings of discouragement and anxiety, and sometimes even fear. In addition, these areas are hard to reach and unsuitable for many types of recreation.

It should be noted that the presence of anthropogenic objects can both enhance and decrease the degree of attractiveness of the landscape. Some anthropogenic objects that fit harmoniously the overall panorama of the terrain (chapels, temples, rural buildings, etc.) are practically inseparable from the overall perspective. However, the aesthetic appeal of the landscapes is significantly reduced by the signs of unsustainable economic activities that can cause feelings of irritation and depression of the observer.

We should also focus on the fact that the respondents who are the residents of densely populated, highly urbanized areas (Moscow, the City of Los Angeles), when assessing the merits of the aesthetic appeal of the studied landscape, preferred the virgin landscapes.



Figure 1: The map of the aesthetic value of the landscape–paysage complexes of the Pyshma River basin within Tyumen Region

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