



## A Variant of the Methodology for Assessing the State of Zoological Complexes

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### ABSTRACT

*Annotation: The author's methodology for assessing the state of zoological complexes of a certain territory, which is developed on the basis of the use of the scale of the degree of preservation (completeness ...) of zoocenoses, is proposed and justified, and information is given on the practical application of this technique in compiling the ecological passport of the urban agglomeration.*

**Keywords:** Estimation Technique, Degree of Preservation, Safety Scale, Model of the Reference Zoological Complex

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**Received:** 20/10/2016

**Accepted:** 22/12/2017

### INTRODUCTION

Faunistic and ecology-faunistic studies are traditionally conducted using a variety of methods for quantitative and qualitative assessment of the status of individual populations of animal organisms or their systems [2, 4].

In this article, the possibility of determining the degree of preservation of zoological complexes in terms of the number and diversity of trophic groups of animals that constitute one or another faunal complex is considered.

To assess the degree of preservation of communities of animal organisms, an evaluation technique is proposed (a set of techniques for the practical determination of magnitude) based on the application of the so-called "scale of the degree of preservation of zoocenoses". Scale (from lat. Scale - ladder) - a series of numbers or values located in ascending or descending order [1, p. 796]. Cenosis (from the Greek koinos - common) - a special community of organisms; the second component of complex words, corresponding to the concept of the aggregate [1, p. 780].

The use of this technique assumes that there is a real model of the "reference zoological complex" or the least destroyed (if necessary, a virtual model of the reference zoological complex), which is used for comparative analysis. Under

the model (from French modele, Latin modulus - measure, sample [1, page 443]) we understood the image of the reference cenosis adopted for that in the studied territory.

We quote the word "reference" in quotation marks, because the ideal nature of the natural object seems to be relative to us, due to the ongoing and ongoing processes in constantly developing natural complexes.

The "reference" zoological complex in our view is a typical natural object for a given landscape, which has the greatest fullness of the animal population.

In the proposed method, it was taken into account that the zoocenosis is in a satisfactory state (on the scale of preservation of the zoocenosis - 100%), provided that the following trophic groups of animals are present in it:

- phytophagous of all levels (invertebrates and vertebrates, terrestrial, near-water and water);
- entomophages and predators of all levels;
- necrophages of all levels;
- coprophages of all levels;
- saprophages of all levels;
- ecto- and endoparasites of different levels.

Table 1 below shows the scale of preservation of zoocenoses. For its construction, a percentage expression of the degree of preservation from 0 to 100% is used, possibly, if necessary, and an expression from 0 to 1, or a score - from 0 to 10, a representation of the degree of safety.

**Tabl1.** Scale of preservation of zoocenoses

№	Signs of preservation	Degree of preservation, %
1.	I have all trophic groups of animals	100
2.	There is no one of the trophic groups or the population of one of the trophic groups is extremely low	80
3.	There are no two trophic groups or populations of both trophic groups extremely low	60
4.	There are no three trophic groups or populations of all three trophic groups extremely low	40
5.	There are no four trophic groups or populations of all four trophic groups extremely low	20
6.	Zoocenosis is destroyed so much that the connections between its components are problematic or impossible	0

The use of the developed methodology was carried out by us in assessing the degree of preservation of the zoocenoses of the Stavropol urban agglomeration.

Longitudinal studies have been conducted for more than twenty years, since 1993 [3, p. 49-58.]. The study of the state of animal communities was carried out by the staff of the Department of General Biology and Biodiversity (formerly the Department of Zoology) of the North Caucasian Federal University. The work was conducted in 25 stations (11 for studying terrestrial animal organisms, 14 for studying aquatic and near-water organisms) located in various parts of the study area.

According to the results of preliminary studies, the Russian forest dacha (typical forest fauna), the Sengileev reservoir (a typical water fauna), the slopes of the Sengileevsky reservoir and the steppe areas between the city of Stavropol and the settlement of Tsymlyansky (typical steppe

fauna) were identified as reference zoocenoses in this territory.

The results of the zoo-ecological study were as follows. The natural fauna of terrestrial animals was preserved mainly in the Russian forest, where the degree of its preservation was 80-90%. In Mamayskaya and Taman forest dachas the fauna is depleted and its safety was 60%, in the Chlynskii forest - 55%, in the Victory Park - 40%. In fact, the listed territories are refugia for all wild and synanthropic animals.

The most significant changes were made to complexes of animal organisms on the territory of the Biberova dacha, Central Park, Pavlovadacha, where a 60-65% loss of the gene pool is found. Strongly destroyed zookompleks along the city's transport highways and in industrial zones where the density of populations has decreased to 50-60%%.

In a critical condition (less than 10%), the water fauna of urban small rivers - Tashla, Mutnyanka, Mamika, Verbovka, Chla, etc., is due to extreme pollution. In the Komsomolsk pond, Svinyachy ponds, ponds of the Pavlovadacha, the safety of the aquatic fauna was only 2-10%.

The natural ichthyofauna has been preserved more or less in the Sengileevsky reservoir (the degree of preservation is 75-80%%) and Kravtsov Lake (safety of 55-60%%).

Thus, the method of assessing the conservation of zoocomplexes, proposed by the authors, is simple and convenient to use, it allows comparative analysis and monitoring of the status and dynamics of the development of zoocenoses in the study area, which allows the possibility of using this technique in faunistic and ecology-faunistic studies.

#### ACKNOWLEDGEMENT

The work was carried out by the authors jointly in 1993-2016 due to money resources of Kharchenko L.N. The authors are grateful to all those who contributed to this study.

#### Authors contribution:

The paper was carried out by the author on the basis of data collected during the identification of animals. Mishvelov E.G. Contributed to the theoretical substantiation of faunistic research. The work was carried out at the expense of Pushkin S.V.

#### Conflict of interest:

In the article, there is no information capable of provoking conflicts of interest, with the exception of information contained in previously published articles by the Pushkin S.V., Kharchenko L.N.

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