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CURRENT STATUS OF THE ICHTHYOFAUNA OF THE ZERAFSHAN RIVER BASIN AND CONSERVATION MEASURES

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Abstract: This article analyzes the current status of fish species inhabiting the Zerafshan River Basin, their biological diversity, changes occurring under the influence of anthropogenic factors, and issues related to ichthyofauna conservation. According to the research findings, both native and introduced fish species are present in the basin. Irrational use of water resources, water pollution, construction of hydraulic structures, and illegal fishing activities have led to a decline in the populations of certain fish species. The study substantiates the necessity of strengthening ecological monitoring, implementing artificial fish breeding programs, and protecting aquatic ecosystems to ensure the conservation of ichthyofauna.

Keywords: Zerafshan River, ichthyofauna, biodiversity, fish species, ecological monitoring, conservation, aquatic ecosystem.

Introduction

The Zerafshan River is one of the major rivers of Central Asia and flows through the territories of Samarkand, Navoi, and Bukhara regions of Uzbekistan. It is considered one of the most important hydrological and biological resources of the region. The river basin plays a significant role in agriculture, drinking water supply, and fisheries.Aquatic ecosystems of the Zerafshan Basin provide favorable habitats for various hydrobiological organisms, including fish species. However, in recent years, intensive exploitation of water resources, pollution from industrial and agricultural wastes, construction of hydraulic structures, and climate change have caused considerable alterations in the ecological condition of the basin. These factors negatively affect the abundance and distribution of fish species.

The aim of this study is to assess the current status of the ichthyofauna of the Zerafshan River Basin and to develop effective measures for its conservation.

Materials and Methods

The study was based on the analysis of scientific literature, hydrobiological observations, and available statistical data collected from water bodies located within the Samarkand, Navoi, and Bukhara regions of the Zerafshan River Basin.

The following methods were used to determine the composition of the ichthyofauna:

- Analysis of scientific literature;
- Comparative ecological method;
- Generalization of hydrobiological monitoring results;
- Statistical data analysis;
- Assessment of the ecological status of fish species.

The main channel of the Zerafshan River, adjacent collector-drainage networks, and reservoirs were selected as the study objects.

Composition of the Ichthyofauna of the Zerafshan Basin

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Research results indicate that more than 30 fish species inhabit the Zerafshan River Basin. These include both native and introduced species.
The main fish species found in the basin are:

1 Common carp (*Cyprinus carpio*)
2 Prussian carp (*Carassius auratus gibelio*)
3 Grass carp (*Ctenopharyngodon idella*)
4 Silver carp (*Hypophthalmichthys molitrix*)
5 Turkestan barbel (*Barbus brachycephalus*)
6 Dwarf sturgeon (*Pseudoscaphirhynchus hermanni*)
7 Wels catfish (*Silurus glanis*)
8 Asp (*Aspius aspius*)
9 Pike-perch (*Sander lucioperca*)
10 Northern snakehead (*Channa argus*)

Most of these species belong to the family Cyprinidae and constitute the dominant component of the basin's ichthyofauna.

Changes in the Ichthyofauna

During recent decades, a decline has been observed in the populations of several native fish species, particularly:

• Turkestan barbel;
• Dwarf sturgeon;
• Certain endemic cyprinid species.

The main reasons for these changes include:

Changes in Water Regime

Large-scale water withdrawal for irrigation purposes has reduced river discharge, leading to the degradation of natural spawning grounds for fish.

Water Pollution

Mineral fertilizers, pesticides used in agriculture, and industrial waste negatively affect water quality and aquatic organisms.

Hydraulic Structures

Dams and reservoirs restrict the migration routes of fish species, thereby disrupting their natural reproduction processes.

Illegal Fishing

The use of electric devices, fine-mesh nets, and other illegal fishing methods contributes significantly to the depletion of fish stocks.

Analyses indicate that although the biological diversity of the Zerafshan Basin remains relatively rich, increasing anthropogenic pressure poses a serious threat to ecosystem stability. The decline of native species may disrupt trophic relationships within aquatic ecosystems. In addition, some introduced species compete with native fish for food resources and habitats, adversely affecting their populations.
Increasing water mineralization and pollution have resulted in the gradual disappearance of sensitive species, while ecologically tolerant species are becoming more dominant. This process leads to the simplification of ecosystem structure and function.

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Therefore, the implementation of an integrated ecological management system is essential for preserving the biological resources of the Zerafshan Basin. Cooperation among governmental organizations, scientific institutions, and local communities is of particular importance.

Conclusion

The Zerafshan River Basin is one of Uzbekistan's important centers of fisheries and biodiversity. More than 30 fish species have been recorded in the basin, including rare and protected species. The current state of the ichthyofauna is negatively affected by irrational use of water resources, pollution, hydraulic structures, and illegal fishing. To conserve and restore fish resources, the following measures are recommended:

1 Conduct regular ecological monitoring throughout the Zerafshan Basin.
2 Implement artificial breeding programs for rare and declining fish species.
3 Strengthen control over compliance with fishing regulations.
4 Reduce pollution of aquatic ecosystems.
5 Establish fish passages to facilitate migration.
6 Expand the network of protected aquatic areas.
7 Enhance environmental awareness and education among the local population.

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