

# BIOLOGICAL SCIENCES

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## SOME ASPECTS OF NEGATIVE IMPACT OF FISHERY MANAGEMENT ON HYDROBIOCENOSES

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**Abstract:** paper considers the peculiarities of the use of natural water resources in Ukraine for fish cultivation and the negative impact of aquaculture on ecosystems. Due to economic activity, intensive cultivation of grass carp, uncontrolled use of organic and mineral fertilizers, dry summers, damage is caused to some components of hydrobiocenoses of small reservoirs. To preserve them, it is proposed at the legislative level to prohibit the complete descent of water bodies, as well as spring burning of dry aquatic vegetation and summer mowing, and to abide with European legal standards for the operation of water bodies.

**Key words:** aquaculture, water bodies, grass carp, hydrobiocenosis, descent of ponds.

In terms of the intensity of the use of natural resources, Ukraine advanced the developed countries of the world and, undoubtedly, ranks first in Europe. This is facilitated by the presence of its significant resources, economic development and accessibility of territories, growing needs in these resources, favorable conditions for

their exploitation. Aquaculture, or artificial cultivation of fish and living aquatic organisms in our country is at the stage of its formation and development, and is gradually gaining importance in solving food issues to provide the population with the necessary amount of fish and fishery products, which in turn are an inexpensive source of protein and fat, vitamins and micro elements. Thus, aquaculture is one of the strategic and promising elements in the area of economic activity, which ensures the formation of food resources of the state.

The Act of Ukraine "On Aquaculture" standardizes the legal regulation of water bodies leasing, as well as provides the reception of a water body in a complex with a land plot, by concluding a leasing agreement for water fund lands. The legal procedure for regulating leasing of water bodies for aquaculture is also regulated by the Water Code of Ukraine, the Act of Ukraine "On Fisheries, Industrial Fisheries and Protection of Aquatic Bioresources" and other regulations. In turn, aquaculture, as an element of the fisheries complex, due to its legal framework and diversification, includes a number of aspects related to direct or indirect intervention in natural ecosystems, which in turn has a negative impact on aquaculture.

The economic activity of business entities engaged in fishery activities is an example of the negative impact of aquaculture on other ecosystem objects. Therefore, the protection of water resources becomes especially acute and relevant.

In recent decades, almost all small inland water bodies have become leased. Leasing agreements are concluded between business entities (farmers) and local authorities (City Executive Committees, Village Councils) for different terms of use of natural and artificial reservoirs, which are located both outside and inside the settlements. The rent charged for each hectare of water area of the reservoir fills the local budget, respectively, the lessee receives the appropriate income from the farm formed by the sale of fish (commercial fish, breeding livestock, fingerling, caviar). However, along with the positive economic aspects of the leasing, there are negative environmental consequences of it in terms of violation of environmental legislation.

First, all ponds, which were formed in the post-Soviet period as a result of regulation of rivers, their tributaries and streams, are artificial reservoirs designed for

both natural and intensive or semi-intensive fish productivity. At the same time, the temporary "owner" of reservoirs wants to get the maximum profit from each hectare of water area of the reservoir from fish farming and sale of fish products, and therefore stock the reservoir with fish in violation of norms. Applying intensive technology of fish farming does not take into account its negative environmental consequences for hydrobiocenoses of reservoirs.

When a grass carp is used in the cultivation as a bio-ameliorator, which feeds with soft and hard aquatic vegetation and destroys it (algae, duckweed, reeds, hornbeam, water lilies), natural spawning grounds and natural forage base for certain species of aboriginal ichthyofauna such as loach, tench, bitterling, pike, etc. are completely destroyed. According to the research results in recent decades, the following aboriginal species of fish have become very rare, and in some places have completely disappeared: tench, crucian carp, bitterling, gudgeon, loach, spined loach, char, red-eye, pike, bleak; they had local industrial significance and occupied a certain place in the food chain of individual aquatic organisms (fish, amphibians, reptiles, wetland birds, aquatic mammals).

Destruction of wetland vegetation as a result of eating by grass carp, mowing in summer and burning in spring threatens the existence of trophic chains and biocenoses of inland waters, including populations of certain species of wetland avifauna. Nests of wetland birds with eggs and chicks die with destruction of reservoirs of aquatic vegetation by lessee. As a result of "economic activity", representatives of certain species of ducks, rails, waders, and small songbirds, which nest and breed in aquatic vegetation, have become rare on leased water bodies. In addition, wetland vegetation, which is an important component of hydrobiocenoses, especially along the banks of ponds, as well as in the tops of reservoirs, serves as a kind of biological filter and protects waters from siltation, especially during downpours, floods, melting snow.

To stimulate the development of natural fodder base, lessees apply organic (manure) and mineral (ammonium nitrate, superphosphate) fertilizers to the reservoir. Uncontrolled use of organic and mineral fertilizers, feeding fish with low-quality

grain waste, as well as the death of fish during summer or winter murrain, entail a change in the hydrochemical composition of water in reservoirs and wells, and affect its quality. In recent years, as a result of increasing average annual temperatures in Ukraine there are long periods of drought in summer, accompanied by frequent shallowing of reservoirs, which in turn leads to higher water temperatures, excessive development of phytoplankton, reducing oxygen levels and as a result summer suffocation of fish. Autumn descent of fish ponds within settlements and winter preventive freezing of them causes a sharp drop in water levels and even its complete disappearance in wells and natural springs that feed reservoirs. Such actions of lessees cause justified indignation among the local population.

Thus, the leasing of small reservoirs causes significant damage to certain components of hydrobiocenoses of small reservoirs. To preserve them, it is proposed to put under restraint at the legislative level the complete descent of water bodies, allowing maximum of 40% water discharge, which to some extent will allow the restoration of aboriginal species of ichthyofauna. Prohibition spring burning of dry aquatic vegetation and summer mowing will allow nesting and breeding of young wetland avifauna.

These aspects will create a legal basis for the regulation of economic activity in the area of aquaculture in Ukraine, which will reduce the negative impact of the leasing of water bodies on natural ecosystems. In our opinion, it is advisable to abide with European legal standards for the operation of aquaculture water bodies, as the European Union has already established a legal framework aimed at reducing the harmful effects of aquaculture economic activities. Therefore, these actions should be implemented in Ukrainian environmental legislation to ensure a balance between economic needs and environmental protection.

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