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Grazing Technology Fish Farming in the Forest Steppe Saural

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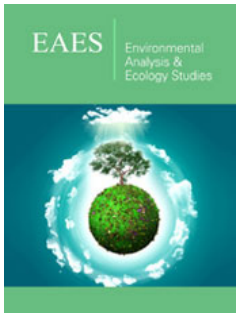

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Annotation

Examples of good practice of developing commercial lake fish farming on the basis of the reclamation of overseas lakes used for the cultivation of commercial food fish by grazing method, in accordance with the regulations of organic products.

Keywords: Eco-fisheries reclamation of lakes; Loosening of bottom sediments; Removal of cane thickets; Polyculture; Pelady; Carp; Sterlet; White cupid

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Introduction

The fisheries reclamation of the lakes of Western Siberia has considerable experience of development. In the modern period, lake commercial fish farms of Chelyabinsk, Kurgan, Tyumen, Omsk, Novosibirsk regions in a number of operated lakes conduct indigenous and ongoing reclamation, contributing to the increase in biological productivity of reservoirs and increasing catches of commercial fish per hectare of water in comparison with traditional fishing and extensive fish technologies. The main thing is that business leaders and leading specialists are convinced of the tangible benefits of the applied reclamations and show increased interest and creativity in the development and implementation of scientific recommendations.

In particular, the specialists of strzok - Sladkovsky commercial fish farm in 2008. started to restore and modernize the plant, which operates in the 70-80s as part of the Sibrybprom Tyumen region,but then ceased its activities. amounted to only 70 tons.

In 2017, the total catch of farmed fish (whitefish, carp, zander, pike) exceeded 1.3 thousand tons, of which the whitefish - 400tons, carp -248tons, pike - 131tons and 31tons of zander.

In 2018-2020, the total annual catches of commercial fish in the fish farm corresponded to 1.2-1.3 thousand tons. Very important and with great positive consequences, STRH workers expect from the complex reclamation of the reed-covered ecosystem of Lake Tavolzhan (Figure 1), the water area of which together with the island is 10 thousand hectares.

In 2008, when we first surveyed the lake ecosystem, the “mirror” of water in the middle of the lake, free of reeds, did not exceed 1-1.2 thousand hectares.

The water of the lake in these years was characterized by the classification of O.A.A. Alekin as chloride-sodium with a total mineralization of 11-12g/dm^3,and the lake was characterized by “no-fly” because, According to locals, during the previous 20 years there were no gold and silver carp or lake minnows. The larvae of the peljadi and pelchira (a hybrid of pelyadi and chira) in the open part of the lake, and thanks tothe earlier-in winter dug-out reclamation

channels (Figure 2), to begin the annual loosening of the lake's yl sediments, including the boundary areas of the reeds. This work is carried out in the second half of summer and autumn with the help of a ripper of its own design (Figure 3).

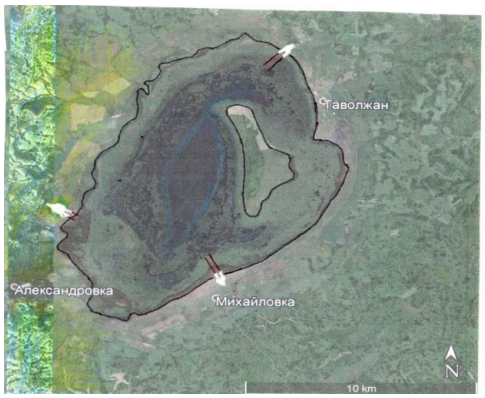

Figure 1: Plan scheme of Lake Tavolzhan: (white) indicates the places of canal construction on three sections of the lake for the passage of boats that loosen bottom yl sediments and catch grown fish.

Figure 2: Reclamation channel (open water for the movement of boats; in winter, to install turboaerators and catching whitefish, left in the process of fishing "on open water."

Figure 3: The ila is the construction of the Sladkovsky Fish Farm.

The length of the sharply honed face of the unit is 3m. In the first year of the production experiment, with the help of two-roll water, it was possible to catch 40 tons of commercial sigolets weighing 90-120g/pc, as well as to reveal in August-September the fact of "persecution" of a moving boat with a slush of bottom sediments by numerous flocks of growing sysk sig fish.

The fish was not at all afraid of the moving boat with the ripper, as they were attracted by pop-up larvae chironoid, the preyma-the most specific Chironomus plumosus. A similar "reclamation feeding" of whitefish is also noted on the lakes of other fish farms of Sauralia.

In 2018-2020, the annual catch of whitefish in the lake. Tavolzhan was 200-300 tons, and the water area with rarefied reeds, where the whitefish are steamed, has increased to almost 3,000 hectares (Figure 1).

The new land reclamationofreeds in the Sladkov fish farm is planned to be combined with biological reclamation - the universe of the yearlings of white amur, the production of which is developed in local fish-nurseries. Thanks to the movement of the reclaimer ila not only on the "open" water, but also along the edge of the reeds, their area began to decrease markedly, as the wind mixing of water masses and the migration of "islands" of reeds to their complete destruction (Figure 4).

Figure 4: Floating and gradually collapsing "islands" of reeds on Lake Tavoljan (2018).

In Sladkov fish farm on four lakes built fish-reclamation bases, similar to Figure 5, which presents the scheme of the fish-melioof the ratification base of the island. Thanks to the creation of a satellite pond with a depth of 6-7m, optimal hydrological conditions arise for the installation of a turboaerator in one of the canals of the pondand on theice formation on thereservoir. The 4-5 kW turboaer in November-March is concentrating all the fish in the lake - in the aeration zone,and creates conditions for its selective catchinga.

A similar approach to reclamation is necessary for the lake ecosystem. Saltaim-Tenis with an area of 26 thousand hectares of the Omsk region, the water of which, unlike the lake Tavolzhan hydrocarbon-calcium and with a very slow decomposition of the annually dying cane, which sank to the bottom of the reservoir.

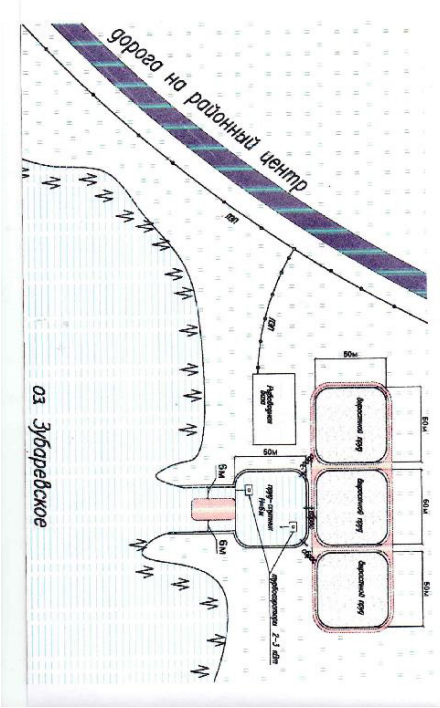

Figure 5: Scheme of a fish-meliorative base on the lake of the Lake zubarevsk Armizon district of Tyumen region.

Our long-standing ecological and fisheries monitoring, "7" and a large reservoir, allowed us to substantiate and propose to the Krutin Fishery and the Administration of the Omsk Region the introduction of effective biological reclamation of Lake Saltaim-Tenis on the basis of the constant cultivation of white amur in the productive polyculture of fish (sig, carp, plant).

The practical implementation of fish-meliorative impact will significantly increase the fish productivity of the large lake and annually receive a significant amount of quality food fish with a cost-effective production regime.

The biological and reclamation essence of the introduction of white amur into the commercial pasture polyculture of carp and whitefish is that the cupid actively eating young plants of reeds and other soft vegetation, turning them into processed plant fiber, "fertilizes" the lake with organics optimal for processing (recycling) bacteria. Bacteria increase their numbers many times, as well as contribute to the growth of biomass and products of zooplankton and zoobentos organisms, which are the optimal fodder for whitefish zooplankton and zoobentophaga carp.

We believe that as the need for biomeliotor- white amur - increases in Saural and Western Siberia, the construction of the zone reproductive complex of plant-eating fish of The Lower-Rybrybrvod should be accelerated.

In the Petukhov district of the Kurgan region on the lake. Matas, with a water area of 300 hectares, is conducting a production experiment on the development and sustainable cultivation of sigova-sturgeon polyculture. Lake Matasa with a maximum depth of 3.7m is a typical forest steppe seam lake with chloride-sodium water and a sum of ions 3-4g/dm^3. The lake is almost free from rigid macrophytes and is distinguished by a small development of soft aquatic vegetation, but with an abundance of gammarus, daphne magn and other representatives of zooplankton and zooplankton.

The first settlement of shredded fry with a mass of 1.5-2g/pc was carried out in accordance with zonal bionormal bionorities in early May 2018. and 3-4-day larvae of peladi and its hybrid forms with chirp and nelma with high development of the feed base showed good results: on October 10-11, the average mass of year-old peladi was 112g, hybrids of whitefish 140-150g, and today's sterlet reached a mass of 320-480g/pc. Held on February 17, 2019. control fishing of cultivated fish showed that the mass of whitefish is close to the average size of 180g, and sterlet - 450g/pc, and all this is due to the high natural forage base of the lake.

Farming that exploits the lake. Matasa, which uses mini-turboaeratops on the pond, and begins work on the creation of a satellite water pond with growth ponds using the technology of N.P. Slinkin, and also provides effective protection of grown fish from premature fishing.

Table 1: Dynamics of catch of commercial fish in Kazan fish, in tons.

Growing and Fishing Facilities	Years			
	2015	2016	2017	2019
Total catch, t	555	1157	1184	1134
Including:				
Sigov (pellet, peccir)	151	659	556	604
carp	-	16	354	192
pike	4	19	43	17
Karas Silver	396	444	212	206
Perch, roach	4	19	19	15

The technology of two-year foraging of whitefish and carp, which is introduced on almost all small lakes of the Kazan Fish company of the Tyumenregion, has significantly increased catches compared to the technology of the annual production of commercial snout, which is evident from the data of Table 1. Analysis of the work of progressive lake fish farms of Tyumen, Kurgan and Chelyabinsk regions of Sauralia shows the real benefit and effectiveness of the implementation of scientific developments on the integrated reclamation of lakes of the overseas type, in a natural state that represent low-yield ichthyocenes with low catches of local low-value fish.

The introduction of full-fledged polyculture technologies in the pasture lake fish farming region will bring Russian fish farming closer to the style of intensive fish farming in modern China, where polyculura is a mandatory technology, I support not only scientists, practitioners, fish farmers, but also all the administrative and administrative regulations of the state and its main working class - municipalities.

A large-scale increase in the total production of commercial fish in the lakes of Sauralia, as the most cost-effective and compliant with the regulations of organic food products, can be achieved by the creation of new lake fish farms of industrial pasture type in each Federation, and the real provision of all foraging areas (aquatoriums) with the life-resistant fish-planting material of the fish-drinking facilities.