

**Research Article**

## Creating of Reserve Artificial Fish Populations of Certain Sturgeon in "Irada Balik" Fish Farm

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**ABSTRACT:**

This article describes the problem on creation of reserve sturgeon populations. Have analyzed the growing characteristics of Russian, Siberian sturgeon and sevruga in Zharkent region piscines. Have studied the hydrochemical state of piscine, morphology and histology, growth and development of the studied species. Research has shown that the conditions of detention of sturgeon in "Irada Balik" Ltd. fish farm meets standards.

**Keywords:** sturgeon, Russian sturgeon, Siberian sturgeon, sevruga, growth and development of young, hydrochemical indicators, parasites, pathoanatomy.

**INTRODUCTION**

World fishing and other aquatic organisms peaked top at the end of the twentieth century. According to experts, at the expense of the natural reproduction of aquatic resources are able to maintain catches at the level of 90 million tons per year. Since fish and seafood are essential components in the human diet, the deficiency of the fishing component in the diet of the population must be replenished. The only way to do this - the artificial reproduction and cultivation of fish and other aquatic aquaculture [1]. According to current statistics, in the world of commodity fish farming in the coming years is going to overtake fishing. The growth of aquaculture industry is about 6-7% per year, outpacing other sectors of agriculture. Kazakhstan is rich by commercial fishing of inventory of water resources and favorable conditions for intensive development of aquaculture and fisheries [2]. The development concept of fisheries of the Republic of Kazakhstan for the period 2007-2015, defines the main formation directions of a unified state policy in the field of sustainable fisheries development in Kazakhstan for the period up to

2015. Formation, preservation, reproduction and rational use of fish and other aquatic biological resources fishery water bodies, development of the fishing and fish-processing industry, commercial fish farming, taking into account the application of the latest methods and modern technologies in the field of fisheries development in the world are the main aims and objectives. [3] Consider to the predicted population growth in the republic and, on the basis of the scientifically recommended standards (14.6 kg per person), to meet the needs of the population in fish and fish products, it is necessary to increase the volume of catching, cultivation of commercial fish and fish imports up to 272.0 thousand tons per year [4,5]. Sturgeon fish are the national wealth of the Caspian states, including the Republic of Kazakhstan. However, the progressive degradation of ecosystem in the Kazakhstani part of the Caspian Sea is due to the increased scale of operation of the oil fields of the Caspian shelf, and poaching capture have reduced the sturgeon population to critical levels. An alternative direction, which allows to save

sturgeon Geofund in natural reservoirs and provide the market with gourmet fish products is the development of sturgeon, which includes the reproduction of stocks and growing in natural reservoirs of marketable products [7]. Currently in Kazakhstan, there are two companies involved in obtaining larvae and young fish of sturgeon - Atyrau and Ural-Atyrau sturgeon hatcheries.

The development of new science-based standards of biological methods of sturgeons breeding and raising, satisfying the requirements of a modern market economy - new direction in fish culture in Kazakhstan. Executive order of the President of the Republic of Kazakhstan №10 / 88 from 22.08.2001 "On approval of import programs in the fields of light and food industry 2001-2003.," was scheduled to develop domestic technologies and samples of food products, animal feed, and light industry, non-competitive in the regional market compared with foreign counterparts [8,9]. According to the priorities of the development of agro-industrial complex of the republic the emphasis is mainly on the use of local facilities breeding and cultivation of local raw materials, local natural resources. Therefore, the development of biotechnological methods of commercial sturgeon breeding for specific conditions of Kazakhstan is relevant. The research purpose is to develop scientific and methodological basis by the technology of obtaining seed and commercial breeding of fish in fish farms in Kazakhstan conditions. Growing fish in ponds and other open water places, choice is largely determined by climatic factors. There are six fish zones marked on the territory of Kazakhstan [10]. Our studies have been conducted in the sixth aquaculture zone. Taking into account the zoning is possible to grow certain species of fish. Selecting an object for cultivation depends on the water temperature. The object of research were the group of eurythermy fish, the optimum temperature for the cultivation is 17-26 °C.

## MATERIALS AND METHODS

To achieve the objectives have been brought valuable commercial fish species. The objects of the research were Russian sturgeon (*Acipenser*

*gueldenstaedti*), Siberian sturgeon (*Acipenser baerii Brandt*), stellate sturgeon (*Acipenser stellatus Pallas*) and sevruga (*Polyodon spathula Walbaum*). Venue of research - Almaty region, Panfilov district, "Irada balyk" Ltd.

Measurements of linear and weight growth of fish during grading is carried out by the standard technique [11]. Determination of hydrochemical characteristics is carried out in the laboratory of Kazakhstan-Japan Innovation Center of the Kazakh National Agrarian University.

1. Sample collection – GOST R. 51593-200;
2. Methods for determination of odour, taste, colour and turbidity– GOST 3351-74;
3. Method for determination of total hardness content–GOST 4151-72;
4. Method for determination of dry residue– GOST -18164-72;
5. Method for determination of alkalinity and mass concentration of carbonates and bicarbonates– GOST R. 52963 -2008 (ISO 9963 -1: 1994, ISO 9963- 2: 1994);
6. Method for determination of calcium and magnesium ions - GOST 23268.5-78;
7. Method for determination of sulphates – GOST 4389-72;
8. Method for determination of chloride content – GOST 4245-72;
9. Determination of elements by atomic spectrometry – RK S GOST R 51309- 2003.

The influence definition of abiotic and biotic environmental factors on the growth and development of sturgeon have monitored the dynamics of the temperature and oxygen conditions daily (2 times a day), the level of pH value in the ponds - 1 time in 5 days. The water temperature and the oxygen content is measured using DO meter and pH meter. Determination of nutrients in the water was carried out with «Sera» company rapid tests (Germany) 1 time in 10 days In order to assess the viability of sturgeon juveniles at different stages of cultivation in ponds was carried out daily allowance of dead animals, and periodically during the final sorting and fishing on, apply direct method of accounting. Study and evaluation of the sturgeon rate of growth were carried out on result of exploitation. Collection, processing and analysis of information material

were carried out according to conventional techniques with the use of computer programs. Calculation of the daily diet of sturgeon feeding in pools, ponds, cages were carried out according to conventional techniques in fish farming. Gathering material for the evaluation of disease control was carried out in the course of calving. Parasitological study subjected 50 copies of Russian sturgeon, Siberian sturgeon, stellate sturgeon and sevruga. When parasitological study used methods for studying fish by A.V. Guseva [12]. Smears of mucus from the body surface and fins of the nasal cavities 96° fixed in ethanol for 5 - 10 min. Then staining was performed with azure - eosin method of Romanovsky - Giemsa for 90 minutes. There were manufactured and examined 200 smears of mucus. Search parasite in the mucus specimens was performed using a binocular microscope MIC-MED Lomo. Digital material is processed with the use of modern methods of variation statistics [13].

## RESULTS AND DISCUSSION

### Hydrochemical state of the fish farm waters.

The research results have been achieved in the course of the following activities: water sampling, followed by analysis of the chemical composition of the samples in the laboratory of water quality assessment in Kazakhstan-Japan Innovation Center at the Kazakh National Agrarian University.

Growing fish in ponds and other open water species choice is largely determined by climatic factors. There are six fish zones marked on the territory of Kazakhstan [10]. Our studies have been conducted in the second area of aquaculture. Taking into account the zoning is possible to grow a certain kind of fish. Choosing the breeding object depends on the water temperature. The object of research served as

**Table 1** – The hydrochemical regime data of individual reservoirs in Zharkent region

Name of reservoirs	pH	Chloride mg / dm <sup>3</sup>	carbonates mg / dm <sup>3</sup>	Sulfates	Nitrates mg / dm <sup>3</sup>	Nitrite, mg / dm <sup>3</sup>	Total hardness, mg-eq- eq / dm <sup>3</sup>
Tyshkan river	6,4	56,72	305,0	no	0,8	0,02	3,2
Besagash Groundwater	6,5	78,0	158,6	no	no	no	4,8
Pond № I	6,6	63,82	463,7	no	1,2	0,01.	9,2
Water fishery	6,5-8,5	-	-	-	40,0	0,08	not regulated

the group eurythermy fish, the optimal temperature for cultivation, which is 17-26 °C. Hydrophysical and hydrochemical parameters correspond to the requirements for fishery water bodies, but the chemical composition of these bodies of water at different times may vary, depending on the climatic conditions [14]. We have studied the water of certain ponds in Zharkent region of Almaty oblast. Water samples were taken in April 2015: Tyshkan river, Groundwater Besagash, pond number 1. Studies have shown the following parameters of physico-chemical parameters of water in the reservoirs studied: pH - 6.4-6.6, total hardness - 3,2-9,2 mEq / L. At the same time indicators of hydrochemical regime of reservoirs Zharkent, Almaty regions confirm the suitability of reservoirs for growing sturgeon species, the establishment and maintenance of artificial populations. The studies results of physical and chemical properties of water in Zharkent region reservoirs showed that all the parameters of the water on the above indicators in ponds are favorable for the growth and development of sturgeon. Gas mode varies depending on the water temperature. When the water temperature is reduced - O<sub>2</sub> content and increased CO<sub>2</sub> content, the pH of the water remains within the permissible norm. These chemical composition of water by individual water bodies are shown in Table 1. According to the above data, you can make the following analysis of the chemical composition of water: in the studied reservoirs dominated by carbonates, chlorides is second. Water reservoirs are investigated by medium hardness, pH - neutral, heavy metals Pb, Zn, Cu, Cd – no exist. The iron and aluminum salts are absent. The water reservoirs investigated by chloride content, compared with the carbonates is significantly lower.

Table 2 shows the content of major ions and the amount of ions in each pond, investigated in April 2015

The results showed; that the physical composition of the water is tested three reservoirs and sources - clear, transparent, odorless, tasteless, no pollution. Due to the fact that water from different sources on the chemical composition of the water was different carbonates mainly dominated by the content of heavy metals were observed.

**Table 2** - Content of major ions and mineralization of water (mg / dm<sup>3</sup>)

Sampling	Ca <sup>2+</sup>	Mg <sup>2+</sup>	Na <sup>+</sup> +K <sup>+</sup>	HCO <sub>3</sub> <sup>-</sup>	SO <sub>4</sub> <sup>2-</sup>	Cl <sup>-</sup>	Ions amount
Tyshkan river	40,1	14,6	204,6	305,0	HeT	56,7	621
Besagash Groundwater	60,1	21,9	172,4	158,6	HeT	78,0	491
Pond № I	108,2	46,2	203,0	463,7	HeT	63,8	884,9

Mineralization of water sources and reservoirs studied ranged from 491mg / dm<sup>3</sup> (groundwater Besagash) to 884.9 mg / dm<sup>3</sup> (pond №1). According to the ion composition of the water belongs to hydrocarbonate class, calcium group. Hydrophysical and hydrochemical parameters correspond to the requirements for fishery water bodies. The water reservoirs is investigated chloride content, compared with the carbonates was significantly lower. Medium hardness water pH - neutral, heavy metals Pb, Zn, Cu, Sd- no exist. The iron and aluminum salts are absent. Thus, the physical composition of water - clear, transparent, odorless, tasteless, have no pollution The chemical composition of water from different sources are different, dominated by carbonate composition of the water, all water is the neutral, heavy metals are absent. Mineralization of water sources and reservoirs studied ranged from 491 mg / dm<sup>3</sup> (Groundwater) to 884.9 mg / dm<sup>3</sup> (pond №1). Hydrophysical and hydrochemical parameters correspond to the requirements for fishery water bodies. According to the ion composition of the water basins studied and the sources according to the classification of O.A. Alekin, attributed to hydrocarbonate class, calcium group. Hydrophysical and hydrochemical parameters of water environment of the investigated reservoirs and sources comply with the requirements for fishery water bodies. Water of "Irada Balik" Ltd fish farm according to hydrochemical indicators can be used for the cultivation of sturgeon and paddlefish, the establishment and maintenance of artificial populations The results of cultivation of sturgeon in "Irada Balik" Ltd fish farm show compliance by the standards of survival and growth.

### **Linear and weight growth of different species of sturgeon and selvuga growing in ponds**

Study and evaluation of the growth rate of sturgeon and sevruga were conducted based on the results of control for fishing on 1 time in 30 days, as well as fishing on the final. Collection, processing and analysis of information material were carried out according to conventional techniques with the use of computer programs [13]. It is noteworthy that the high survival rates of juvenile fish were obtained under the conditions of early transition to feeding artificial feed and in a more sparse planting, respectively. One of the important criteria of viability of sturgeon and sevruga in Zharkent region when grown in ponds is the percentage of waste fish for a certain period of time (case). The survival rates of sturgeon species are presented in Table 3. As can be seen from the percentage of waste among cultivated in ponds of sturgeon is insignificant and is within acceptable limits. А сибирский осетр и веслонос занимают промежуточное положение (1,6-1,9%) At the same time has a high viability of Russian sturgeon, including the deaths amounted to 1.2%. In a comparative perspective the greatest deviation was observed among the stellate sturgeon (2.6%). A Siberian sturgeon and sevruga are intermediate (1.6-1.9%)

**Table 3** - Growth and preservation of sturgeon and sevruga growing in ponds

Indicators	units	Fish spices			
		Russian sturgeon	Siberian sturgeon	Sevruga	sturgeon
growing period	24h.	150	150	150	150
considered	item.	427	260	117	62
Initial weight	kg	1,6	1,5	1,4	1,8
safety	%	98,8	98,1	97,4	98,4

final mass	kg	2,0	1,9	1,8	2,3
Fatness on Fulton	unit	0,8	0,7	0,8	0,8
Absolute growth	g	400	400	400	500
The average daily gain	g	3,0	3,0	3,0	3,3
relative growth	%	22,2	23,5	25	24,3

Analyzing fluctuations in survival rates of juvenile sturgeon at cultivation in ponds revealed that this figure ranges from 97.4 to 98.8%. Thus, indicators of the viability of farmed sturgeon indicate a fairly good adaptation to the conditions of their ponds in Zharkent region. Most of the sturgeon - a large, long-lived valuable commercial fish [15,16]. Многие виды имеют особую товарную ценность. Many species are have particular commercial value. Sturgeon mined in natural bodies of water and grown in commercial farms. Therefore, there is information about the growth of fish, obtained not only as a result of age determination by saw cut fin rays, but also for tracking the growth during the experimental and commercial cultivation, as well as rearing as seed [17,18,19,20] .

In the study of fish growth is important to clarify the following issues:

- 1) the nature of growth in the life cycle - asymptotic relationship of body size and weight of age, parabolic, or what else, ie the analysis of "growth curve";
- 2) the potential growth rate at different body weight in optimal, usually experimental conditions;
- 3) the growth rate dependence on the temperature;
- 4) the growth of this type of fish in different natural water bodies;
- 5) seasonal fluctuations in growth due to the annual course of temperature;
- 6) the effect on the rate of growth of puberty;
- 7) differences in growth between males and females;
- 8) individual differences in growth rate.

In our studies, we staged only some specialized tasks, so the information could be received at all points of the program. The greatest average length of the month of April were juvenile paddlefish. According to the month of October it was observed the same pattern: the greatest length of paddlefish has the advantage over the other groups, which is 0.7-0.9 cm, or 9,6-11,0%, which is in all cases significantly ( $P > 0.999$ ). The lowest average in length were stellate sturgeon fry. Russian sturgeon and Siberian sturgeon had the same figures for the length of ( $0,66 \pm 0,01$ ). Performance coefficient of variation ( $C_v$ ) indicate the presence of a large variation in the length of the body within each group, which is undesirable. Relatively homogeneous offspring along the length of the body is derived from the Russian sturgeon. However, other types of fish of any species belonging patterns of influence and months of the year on the degree of variability of body length of juveniles has been established. Thus, according to the results of these studies found that under conditions of Almaty region juveniles Zharkent region of valuable commercial fish species are not inferior to body length standard. Variability of body weight and length in juveniles studied species grown in "Irada balyk" Ltd. are presented in Table 4.

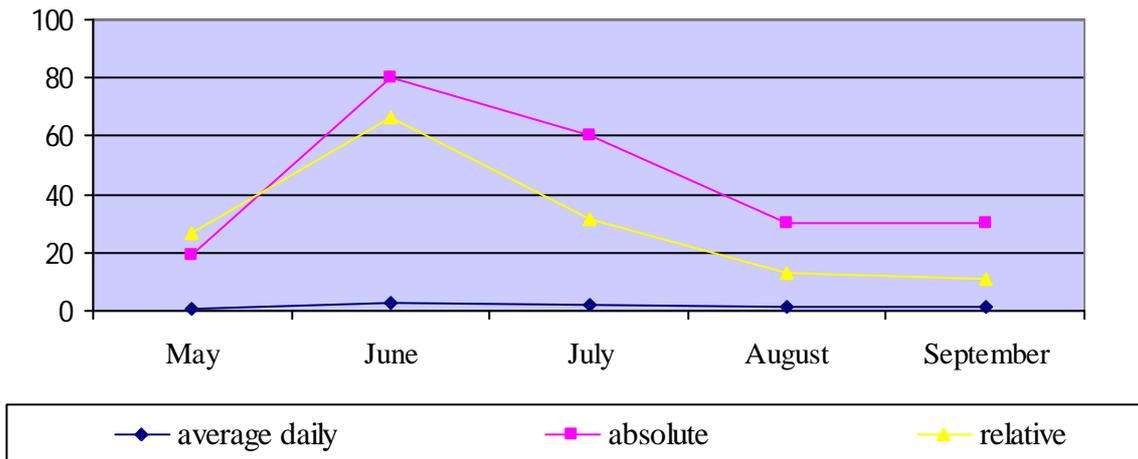
**Table 4** - Variation of live weight and length in juveniles studied species grown in "Irada balyk"

date control ling fishing	Type of fish	n	Average weight, kg (M ± m)	δ	$C_v$	average length, cm (M± m)	δ	$C_v$
29.04.15.	Russian sturgeon	427	1,6±0,01	0,12	9,2	0,60±0,01	0,02	4,0
	Siberian sturgeon	260	1,6±0,01	0,16	13,3	0,60±0,01	0,05	10,0
	stellate sturgeon	117	1,4±0,02	0,19	15,8	0,59±0,01	0,05	10,4
	paddlefish	62	1,8±0,02	0,22	14,7	0,62±0,01	0,05	10,5
21.09.15.	Russian sturgeon	422	2,0±0,01	0,12	7,6	0,66±0,01	0,03	5,2
	Siberian sturgeon	255	1,9±0,01	0,13	8,7	0,66±0,01	0,03	5,0
	stellate sturgeon	114	1,8±0,02	0,19	13,6	0,65±0,01	0,05	8,8
	paddlefish	61	2,3±0,06	0,54	30,0	0,73±0,01	0,05	8,9

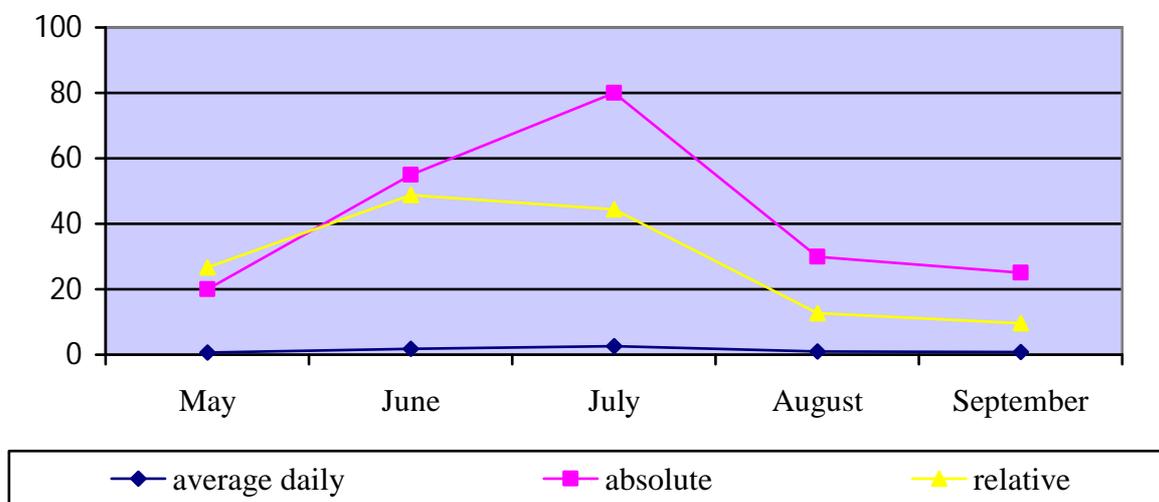
Analysis of the live weight of species studied different species shows that in spring and autumn periods of paddlefish were largest than the rest (0.2-0.4 kg 0.3-0.5 kg in spring and autumn). The coefficient of

variation ( $C_v$ ) indicates that all studied species of sturgeon are characterized by a fairly high degree of phenotypic variability. At the same time we have not found any patterns associated with specific membership or season of the year. Higher coefficients of variation in body weight in the spring and autumn periods observed in stellate sturgeon and paddlefish in comparison with other species. This is because the sturgeon and paddlefish at life in ponds Zharkent region under the same conditions and feeding showed more intensive growth and development. The lowest average live weight in the spring and autumn periods were Siberian sturgeon and stellate sturgeon. The difference of live weight in relation to the Russian sturgeon and paddlefish was in the spring of 0.2 - 0.4 kg, in the fall - 0.2 - 0.5 kg, statistically significant ( $P > 0.99$ ,  $P > 0.999$ ).

In general, the growth of fish in ponds for growing (for the size-weight group) is presented in Figures 3 - 6.

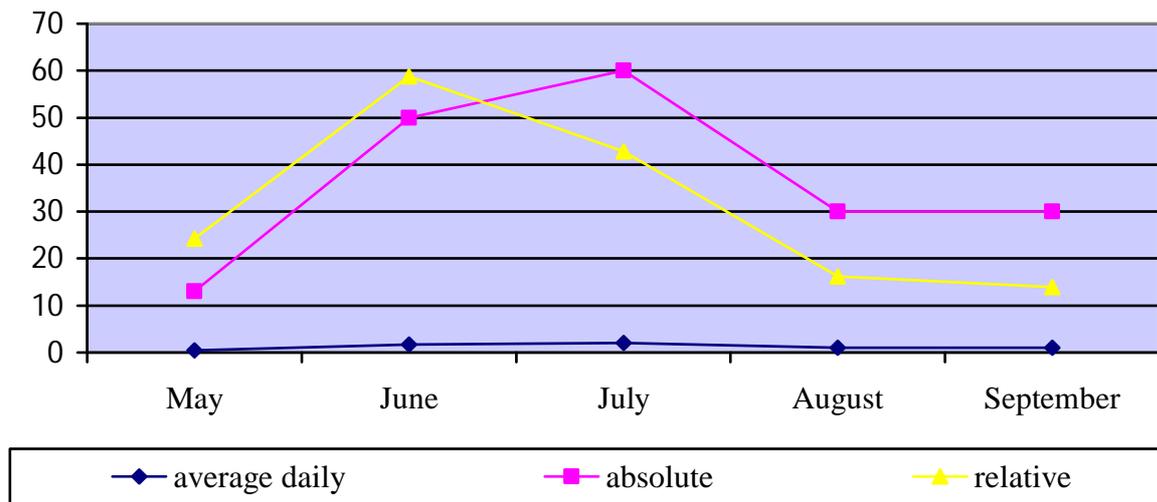


**Figure 3** - The intensity of the growth and development of young Russian sturgeon at cultivation in ponds. Absolute figures of live weight can not be the final result of the determination of the growth rate of juveniles. For a more complete picture of the intensity of our growth indicators have been identified and the relative average daily weight gain of juvenile sturgeon (fig.3-6). As can be seen from the average daily weight gain compared juvenile sturgeons depends on species and months of the year. The highest rates of average daily gain for the five-month period had a young Russian, Siberian sturgeon and paddlefish. The advantage of them in comparison with the young of other species is 0.7 g or 35%. It should be noted that there is a certain tendency of superiority of the average daily weight gain of all juveniles in June-July compared with the other months. The lowest average daily weight gain has stellate sturgeon fry.

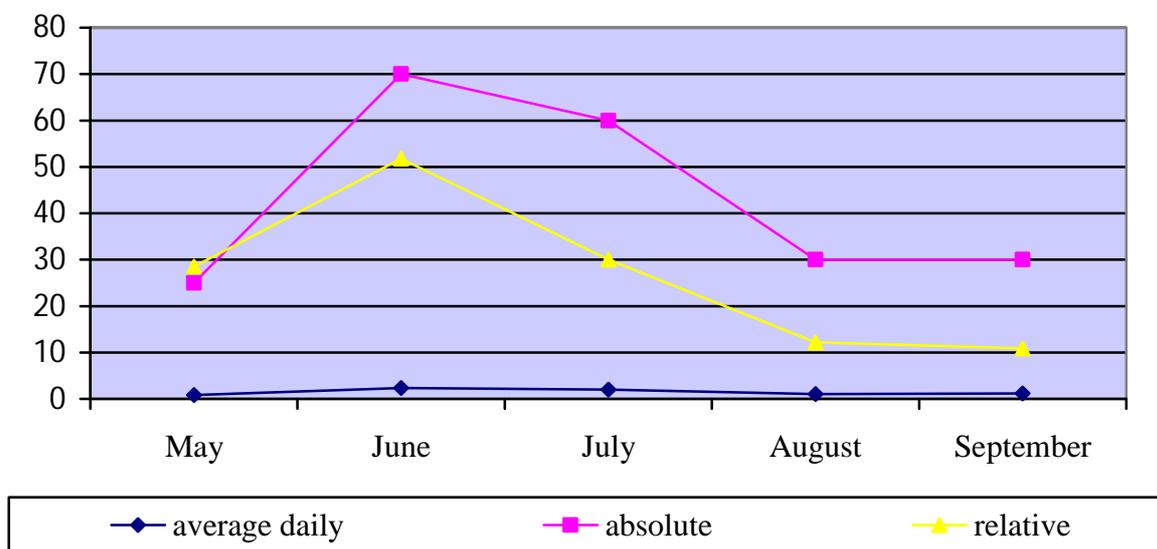


**Figure 4** - The intensity of the growth and development of young Siberian sturgeon at cultivation in ponds

A somewhat different picture is observed by the relative increase in body weight. First of all, there is no clear-cut advantages of different types of accessories. Higher relatively young growth of one type according to five months is not confirmed by other species, even though they were in the same conditions and feeding. A similar change in the ranks of the different species of fish on the relative increase in body weight observed juveniles depending on species and months of the year. From the data tables of four species seen some consistent pattern inherent in all studied groups. Within each comparison group have better growth energy juveniles All four species in the summer months. The superiority of their average daily weight gain in the 0,2--0,5 g, or 1.3-1.5%, and the relative increase on 1,0-5,3%. Perfection on live weight and growth rate of juveniles of all species in this period is due to the phenomenon of water temperature setting.



**Figure 5** - The intensity of the growth and development of young stellate sturgeon at cultivation in ponds



**Figure 6** - The intensity of the growth and development of young paddlefish at cultivation in ponds

Thus, the data on live weight of juveniles species studied indicate that among the best indicators of the species examined had paddlefish. Russian and Siberian sturgeon in spring and autumn periods of steadily occupied an intermediate position. This clearly shows that all kinds of sturgeon and paddlefish are well adapted to the conditions of pond farming Zharkent region, because their body weight is due to the interaction of genotype fry with the terms of the environment. From grown young sturgeons and paddlefish share of large and medium-sized Russian sturgeon is 50%, in stellate sturgeon - 46.3%.

In developing effective formulations of high-grade feed, including for the studied species, one of the main objectives is to reduce the cost of feed. It is known that the growth rate largely depends on the

content of fish feed in the protein. The results of the use of domestic and imported food for growing young fish in the ponds of sturgeon are listed in Table 5.

**Table 5** - The fish fry indicators sturgeon at cultivation in ponds with different feed production

Feeding type	Type of fish					
	Russian sturgeon		Siberian sturgeon		Sevruga	
	initial mass kg	the final mass, kg	initial mass kg	the final mass, kg	initial mass kg	the final mass, kg
importing	1,6	2,1	1,5	1,9	1,4	1,8
domestic	1,6	1,9	1,5	1,7	1,4	1,6

Feeding was carried out manually on the calculated rates. Feeds were added in portions, making sure eatability. Feed composition of domestic and foreign production. Research shows that when using imported food compared with the domestic to the end of the experiment the mass of all species of sturgeon fry was higher by 0.2 kg. 1 regularly once a month check weighing, where the weight and length were measured by standard methods. For weighting used electronic scales.

**Histological changes in sturgeons in ponds Zharkent region.**

In our country, more and more attention of the fish business attract sturgeon. In this regard, created and successfully operate fish farms involved in the production of delicatessen products - caviar and sturgeon meat. Therefore, epizootic monitoring of fish is mandatory for many diseases. Histological method is not always possible to accurately diagnose the disease. However, he gives the answer how deep in the tissue and cellular level has gone pathological process and how widely affected all investigated herd fish. The bodies apparently healthy fish at the tissue level may be at different stages of disease, that allows you to determine the degree of destruction of the whole herd [21]. Histopathological changes are integral result of various biochemical and physiological changes in the body [22,23]. Identification of emerging pathologies and dysfunction in fish body systems is important for understanding the reasons for the decline or disappearance of fish populations, predict changes in the conditions of decrease or increase the toxic load, as well as strategy development and methods of conservation and restoration of fish resources. Morfopatologicheskie research Volga fish showed that the condition of the organs and tissues due to the state of the environment, the nature of the distribution of pollutants on the waters of the reservoir and environmental features The aim of our study was to investigate the histological changes of sturgeon. histological examination gills, gonads, liver and muscle have been conducted sturgeon. The material was

collected in a pond farms Zharkent region in 2015. Histological preparations were prepared by conventional methods. There were prepared and analyzed 27 histological preparations. Histological analysis of the reproductive system 5 was produced on the testes and ovaries 9. Histological examination of the above bodies revealed that the majority of surveyed fish has histologic pathology in more than one organ. Light histologic abnormalities were characterized by elongation and deformation of the respiratory lamellae. Moderate deviations in the gills hyperplasia manifested in their end sections, hyperemia filaments. There was hypoplasia, deformity respiratory lamellae, desquamation of respiratory epithelium. Severe morphological changes were expressed in underdevelopment, bending, merging respiratory lamellae on large plots. In single fish was marked atrophy of the respiratory lamellae, exposure of one side of the gill filaments. Pathology of the gonad. The main condition for the sustainable existence of its population is of reproductive potential due to both the size and structure of the population, and physiological characteristics of the functioning of the reproductive system, fertility is determined individually [24]. Therefore, histological studies of the reproductive systems of fish are highly relevant for the assessment of the stability and capacity of the reproduction of the population. It is known that the largest number of violations in the gonads in sturgeon falls on adult fish in young individuals observed the normal development of sexual cells and glands. In our studies, we were studied gonads only juveniles.

This appears to be explained by the relatively low degree of abnormalities in the gonads. Deviations in the reproductive system were easy character. Histopathological abnormalities in the ovaries of the investigated sturgeon manifested in the deformation stage oocytes protoplasmic growth pycnosis nuclei. The majority of the testis were investigated at the breeding stage of spermatogonia and had a normal structure. Light histopathological abnormalities manifested in the presence of gaps between the ampules testes. Light morphological abnormalities in the ovaries characterized by deformation of oocytes stage protoplasmic growth karyopyknosis nuclei. Met oocytes in the stage of nuclear fission. It was noted a small number of oocytes among a large number of adipose tissue. In the testes in the breeding stage spermatogonia marked small cavity between the seminiferous tubules. Most investigated testes had normal structure.

The proportion of fish with slight morphological changes was 72%, 28% - did not reveal abnormalities in the gonads. Histopathological index was 1.7 points, which corresponds to mild disorders.

The pathology of the liver. Light histopathological abnormalities in the liver manifested in fatty degeneration of hepatocytes, presence of clusters of lymphoid cells and hemosiderin pigment granules. Observed hyperemia of blood vessels. Moderate

morphological abnormalities in the liver characterized by necrosis of hepatocytes, the displacement of the nuclei of hepatocytes center to the periphery, pyknosis nuclei. Marked accumulation of hemosiderin granules and lymphoid cells. Pathology of muscles. Light histopathological abnormalities in striated muscle tissue to curvature of the longitudinal sections characterized by muscle fibers. There were minor lipid inclusions. On cross sections of bundles of muscle fibers were somewhat divided. It was noted the presence of optical cavities at the periphery of myofibrillar fields. Moderate morphological abnormalities in the longitudinal sections are expressed in deformation and pulping myofibrils. Between parallel rows of fibers marked lipid inclusions. There was the presence of blood cells in the intramuscular space. On cross sections of the individual fibers in bundles absent and replaced lipid inserts, which are preparations have the form of Cellular optical cavities. Severe histopathological abnormalities in the muscle tissue in the longitudinal sections were manifested in the lysis of myofibrils with the formation of detritus. It marked intermittent course of the replacement fibers and connective tissue lipid inserts. In the intramuscular tissue containing blood cells. On cross sections observed decay fiber lysis of myofibrils.

**Table 6 - Results of histopathological analysis of organs and tissues of sturgeons**

Organs and tissues	The degree of pathology	Middle histopathological index (Scores)
Gills	5,3% - light (1 x 2 points) 68,4% - moderate (13 x 3 points) 26,3% - heavy (5 x 4 points)	3,2
gonads	28% - rate (5 x 1 point) 72% - lightweight (13 x 2 points)	1,7
Liver	5% - the rate (1 x 1 point) 75% - light (14 x 2 points) 20% - moderate (4 x 3 points)	2,2
Muscles	16% - light (3 x 2 points) 63% - moderate (12 x 3 points) 21% - heavy (4 x 4 points)	3,1

Thus, on average, for all investigated sturgeon gills histopathological index was 3.2 points, which corresponds to moderate deviations (Table 6). Histopathological index in the gonads

averaged 1.7 points, which corresponds to a slight deviation in the reproductive system. Histopathological liver index was 2.2 points, which corresponds to a slight morphological

abnormalities. Histopathological muscle index score of 3.1, which corresponds to moderate deviations in their structure. Thus the internal organs and tissues (gonads, liver, muscles) negative externalities indirectly through the blood and lymph, whereas the gills exposed to immediate direct impact of negative environmental factors. This, perhaps, explains the deviation in the gills, although in general they have been modest. Based on the above, we can conclude that the results of histopathological examination of certain organs of sturgeon showed that the state of water in the reservoirs Zharkent region is satisfactory.

#### **The results of parasitological and pathological control**

When parasitological examination sturgeon grown in ponds "Irada Balik" Ltd. conducted research integument fins, gills and nasal cavity. Under natural conditions, parasites tend to be distributed uniformly in the host population, mastering most of her [25]. Using the resource of the host population in the interests of their populations, they have not caused among the hosts of extreme situations - illness, a significant suppression of growth. In these cases, the extent of infestation high (60-100%) accompanied by a relatively low intensity when a single host individual parasite living individuals. At the same time, in terms of aquaculture, while other densities of fish, parasitic infestations cause more significant damage to the host organism. Intensity of infection can be much higher, which may cause death of fish. External parasites were found in the studies.

#### **CONCLUSION**

In fisheries waters of Kazakhstan for many years there was a reduction of populations of the most valuable commercial fish species and their replacement by less valuable in relation to the consumer, views. Do not unimportant factors identified such a development is a selective thought aimed primarily at the most valuable, and therefore more profitable species. In this situation, the impact on the populations of species of fish from one side of fishing, and on the other side of the released species occupy an ecological niche and non-trophic competition restore populations of species at the same level

without external interference, it is doubtful. For some species there is a need to create artificial populations for subsequent reintroduction, restocking and further development. Water fish farm LLP "Irada Balik" according to hydrochemical indicators meet the requirements for the cultivation of paddlefish and sturgeon, the establishment and maintenance of artificial populations. In the context of Zharkent region in terms of extent and variability of the main characters in different species of sturgeon there is some difference. Depending on the species, season, set a high variability of linear length in juveniles of all species of sturgeon. Spring linear juveniles length ranged from 0.59 to 0.62 cm variation coefficient was 4,0-10,5%, respectively, during the autumn fishing on -. 0,65-0,73 cm 5,0-8,9%. The highest phenotypic variation of the trait (10.4%) observed in young stellate sturgeon and paddlefish at a high arithmetic average value, the lowest - in the Russian sturgeon (4.0%) and Siberian sturgeon (5.0%). Species belonging and seasons have a significant influence on the formation of productive qualities of sturgeon fingerlings. The young paddlefish had higher body weight growth rates in all periods, and significantly superior to peers (stellate sturgeon, Russian and Siberian) 0.2 - 0.4 kg or 11.1 - 22.2% in the spring and autumn, respectively, weighing 0.3 - 0.5 kg or 13.0 - 21.7%. The survival rate of juvenile sturgeon at cultivation in ponds ranges from 97.4 to 98.8%. Indicators viability of farmed sturgeon indicate a fairly good adaptation to the conditions of their ponds Zharkent region. All species of sturgeon have adapted well to the conditions of ponds Zharkent region. From grown sturgeon share of large and medium-sized Russian sturgeon is 50%, in stellate sturgeon - 46.3%. In terms of pond farming Zharkent region of greatest growth and development indicators were observed in stellate sturgeon and paddlefish. We examined copies of the Russian and Siberian sturgeon, paddlefish and stellate sturgeon in the economy "Irada salmon" are not mentioned diseases. The results of cultivation of sturgeon in fish farm LLP "Irada Balik" show their compliance with the standards for the survival and growth rates.

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