Federal Agency for Fishery
(Rosrybolovstvo)
Federal State Budgetary Scientific Institution
"Kamchatka Research Institute of Fisheries and Oceanography"
(FSBSI "KamchatNIRO")

Seen and agreed"
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_____2018

REPORT (CONTRACT № 01/18-НИР dated 16.01.2018)
Subject: West Kamchatka Salmon Fishery Monitoring (Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya, Kol) in 2017

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CONTENTS

INTRODUCTION

In 2017 “Vityaz-Avto” Co., LTD continued to undertake environmental certification assessments to the standards of MSC for West Kamchatka fisheries: Pink (*O. gorbuscha)*, Chum (*O. keta)*, Red (*O. nerka)* and Silver salmon (*O. kisutch)* in Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya, Kol.

The assessments were conducted by monitoring Pacific Salmon stock and fisheries in the mentioned rivers with the scientific support of KamchatNIRO. This report is prepared for annual audit for rational management of salmon fisheries in Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya, Kol.

In 2017 Vityaz-Avto Co., LTD requested scientific information from KamchatNIRO. The list of questions is as follows:

1. Provide analytical data on Pacific Salmon spawners escapement in Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya, Kol rivers in 2017, and compare this data with 2015 and 2016.
2. Demonstrate the total catch of all West Kamchatka Fisheries in 2017 (indicate the name of the companies, each Pacific Salmon species and fish escapement points)
3. Provide data on Ozernaya river Red Salmon stock and fishery in 2016 and 2017 (spawners escapement, river/sea/total catch).
4. Provide summarized information on actions taken by Anadromous Fish Catch Monitoring and Controlling Commission in Kamchatka krai (Protocols) in 2017 and reasons for these actions in certified West Kamchatka fisheries.
5. Provide a table with aerovisual monitoring results on Pacific Salmon spawners escapements in West Kamchatka rivers (Koshegochek, Golygin, Opala, Vorovskaya, Kol) in 2017 and compare this data with that of 2015 and 2016.

Taking into account that some of the questions cover the same subjects, we decided to combine the questions 1 and 5 into one chapter in this Report (CONTRACT № 01/18-НИР dated 16.01.2018). Besides, the more detailed information about Ozernaya river Red Salmon is separately discussed in Chapter 3.

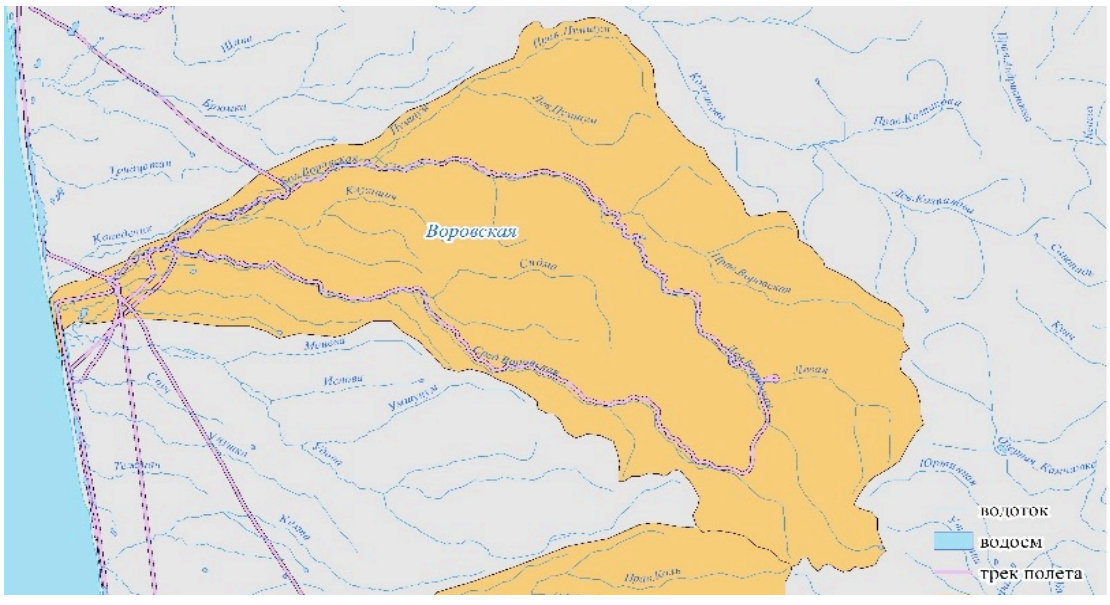
That is why in other chapters Red Salmon is mentioned in less detail.
Below you can find answers to the above listed questions.

Chapter 1. Provide analytical data on Pacific Salmon spawners escapement in Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya, Kol rivers in 2017, and compare this data with 2015 and 2016.

In 2017 monitoring surveys were aimed at assessing Pacific Salmon spawners in Kol, Vorovskaya and Opala rivers. Pink and Chum salmon spawning grounds were surveyed in Kol and Vorovskaya rivers (9 and 30 August). Early Chum salmon escapement level was surveyed in Opala river (18 July). The schemes of the water basins covered by this research as well as the helicopter tracks are shown in the Fig 1.1.

The limited funding of aerovisual surveys in the West Kamchatka coast did not allow to conduct a full-format research. That is why only the mainstream of Vorovskaya river, Levaya Vorovskaya river and Srednyaya Vorovskaya river were surveyed. In Kol river basin the mainstream from the river mouth to the tributary of Kiumshechek river were surveyed. In Opala river the midstream and tributary of Savan river were surveyed. Other water streams in the West Kamchatka coast were not covered by research in 2017 due to the lack of funding.

The direct assessment and count of Red salmon spawners at the fishing weir in “Ozernovksiy” observation point provided the information on Red Salmon spawners escapement into the Kuril lake (river Ozernaya).



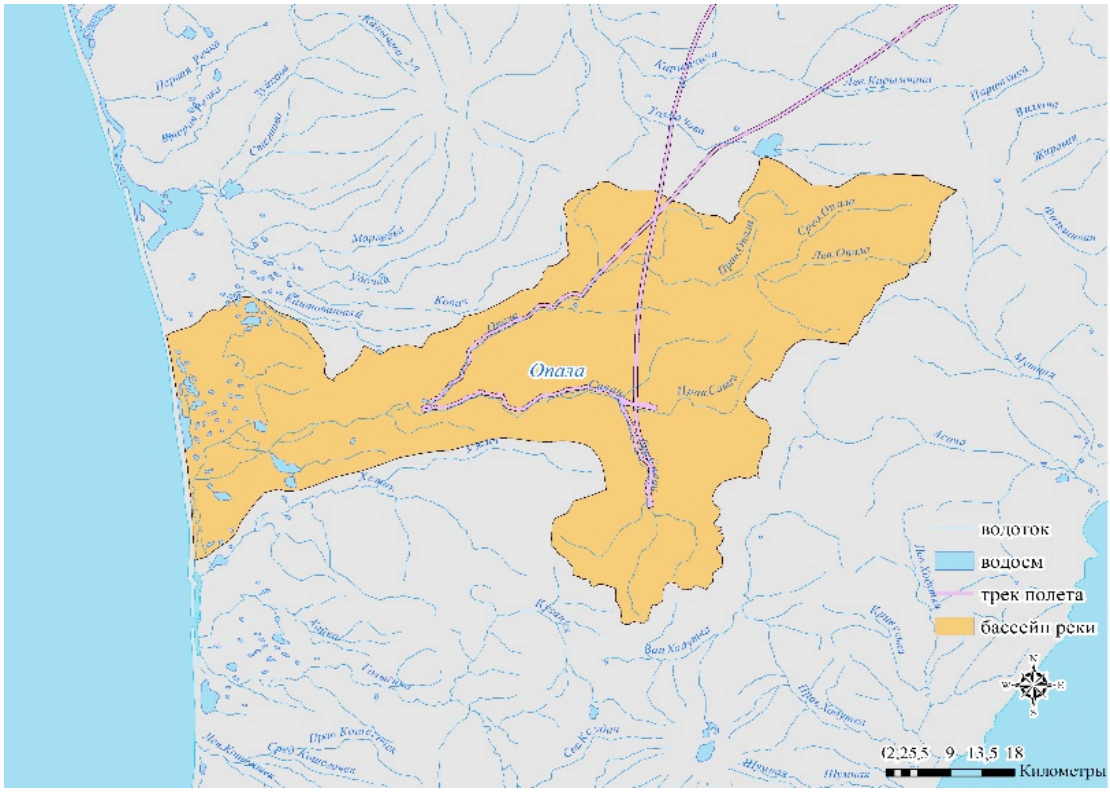


Fig. 1.1 — Helicopter track, aerovisual surveys on Pacific Salmon spawners in Vorovskaya, Kol and Opala in 2017.

PINK SALMON

From 2000s the overall Pink salmon spawners escapement into Ozernaya, Koshegochek, Golygina, Opala, Kol and Vorovskaya rivers varied from 70 thousand to almost 22 million spawners. For the even-year reproduction line (large harvest) the number of escaped spawners varied within the range of 3.9 to 21.9 million spawners (Fig.1.2). The number of odd-year reproduction line (weak harvest) for Pink salmon did not exceed 5 million spawners, and on average accounted for 300 thousand spawners.

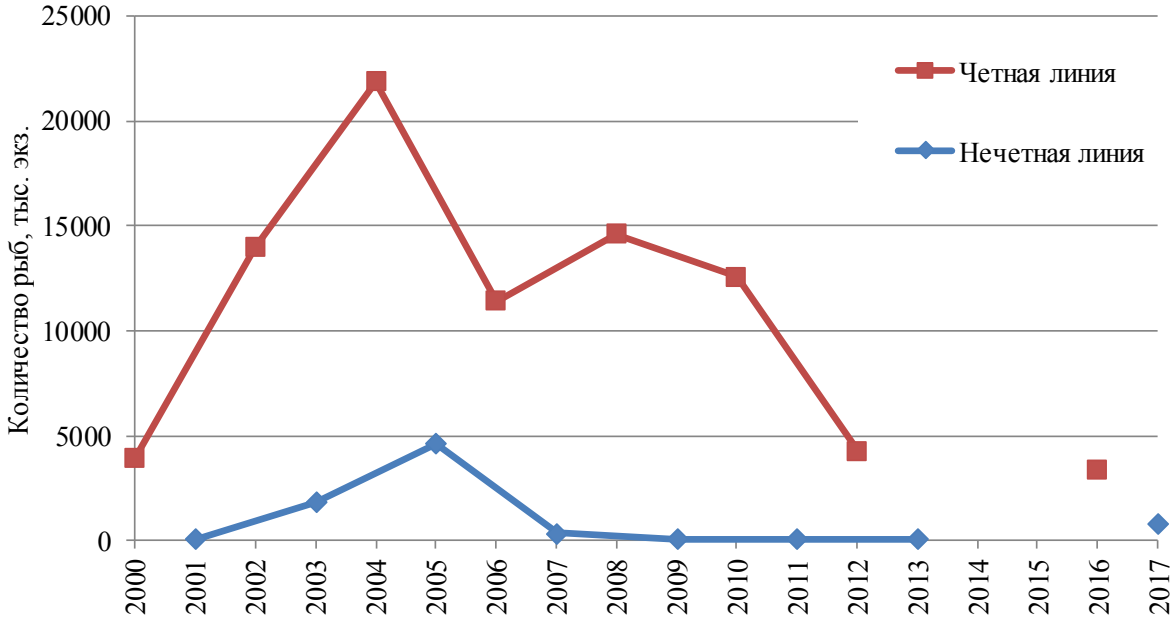


Fig. 1.2. Overall number of counted Pink salmon spawners (two reproduction lines) escaped to spawn in rivers Ozernaya, Koshegochek, Golygina, Opala, Kol and Vorovskaya (2000-2017)

Escapement trend for Pink salmon of even-year reproduction line started to decline in 2004, odd-year line – 2005. For both lines the most productive rivers are Vorovskaya, Kol and Opala,

For the period of 2000-2017 about 400 thousand Pink salmon spawned in odd years and more than 3 million – in even years, which is 88% and 83% of the total number of spawners in all other rivers respectively (Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya, Kol). The comparative analysis of Pink Salmon spawners escapement data is presented in Table 1.1 and 1.2

Table 1.1

Escaped Pink salmon spawners, odd-year line, in West Kamchatka rivers in 2001-2017, thousand spawners

River	2001	2003	2005	2007	2009	2011	2013	2017
Ozernaya	17,5	95	130	–	–	0,6	–	–
Koshegochek	0,3	36	82,5	10,7	5,25	–	–	–
Golygina	16	50,5	180	41,5	5,5	–	–	–
Opala	21,5	130	925	28,5	37,5	–	0,9	–
Kol	3,5	875	925	24	22,5	85	85	625
Vorovskaya	27,5	665	2400	280	–	5,5	–	231,1
Total	**86,3**	**1851,5**	**4642,5**	**384,7**	**70,75**	**91,1**	**85,9**	**856,1**

Table 1.2

Escaped Pink salmon spawners, even-year line, in West Kamchatka rivers in 2001-2017, thousand spawners

River	2000	2002	2004	2006	2008	2010	2012	2016
Ozernaya	925	950	475	150	775	–	–	–
Koshegochek	440	352,5	665	465	185	7,5	–	–
Golygina	385	875	2800	925	1250	235	270	–
Opala	565	3300	5750	3650	1900	580	258,5	–
Kol	885	3750	5550	2750	4400	5250	3750	3300
Vorovskaya	750	4750	6650	3500	6100	6500	2,7	100
Total	**3950**	**13977,5**	**21890**	**11440**	**14610**	**12572,5**	**4281,2**	**3400**

In this mentioned period Pink salmon escapement during weak (odd-year line) and high (even-year line) harvest in the mentioned rivers was in general characterized by the same dynamics (Fig. 1.3 and 1.4). This evidently shows that the processes, governing interannual salmon spawners run changes in Ozernaya, Koshegochek, Golygina, Opala, Kol and Vorovskaya, are quite similar. The only exception is Pink Salmon in Ozernaya river in large harvest years. However, this only proves the fact that this river is the only water basin where Pink Salmon is not targeted for the commercial catch.

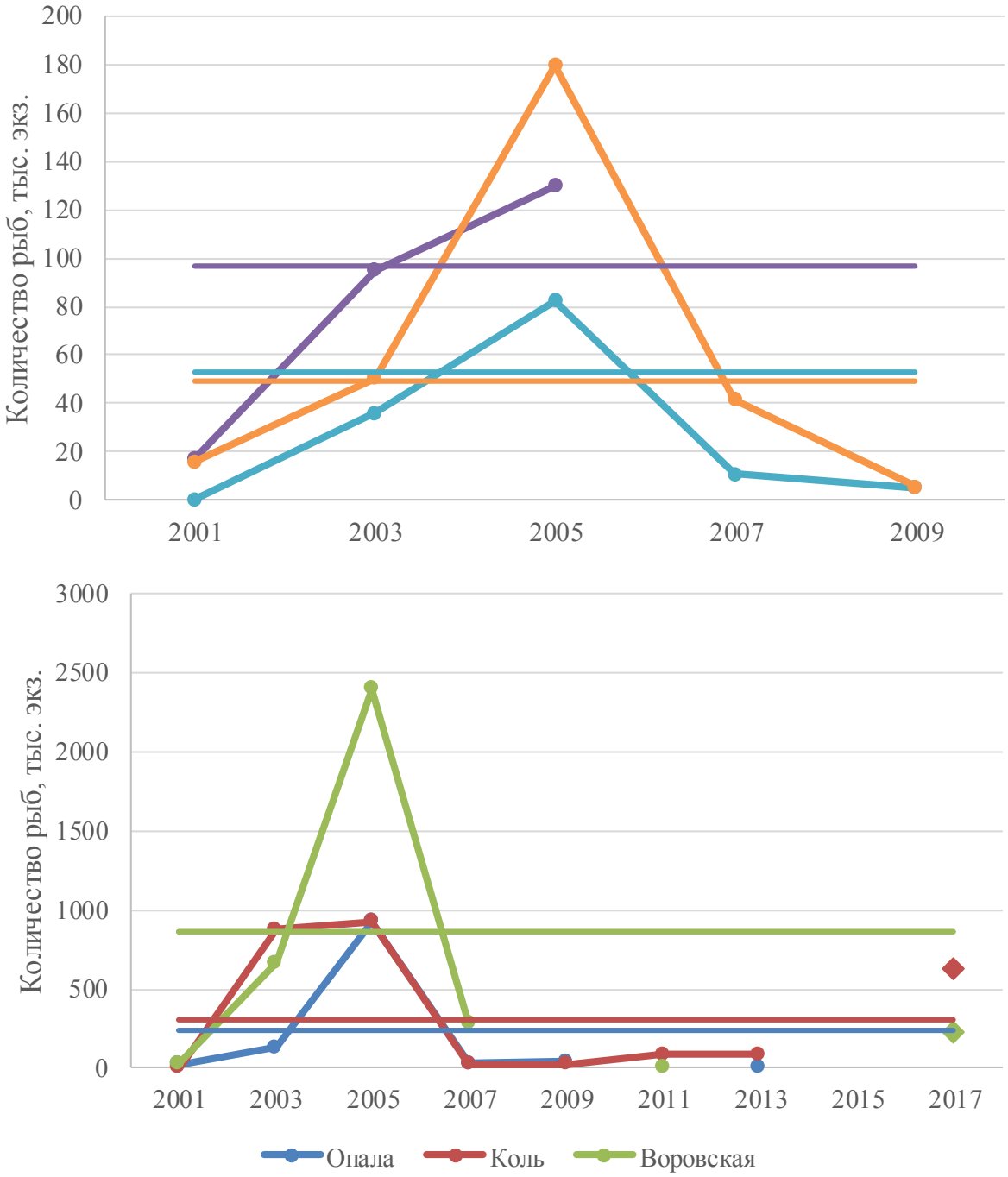
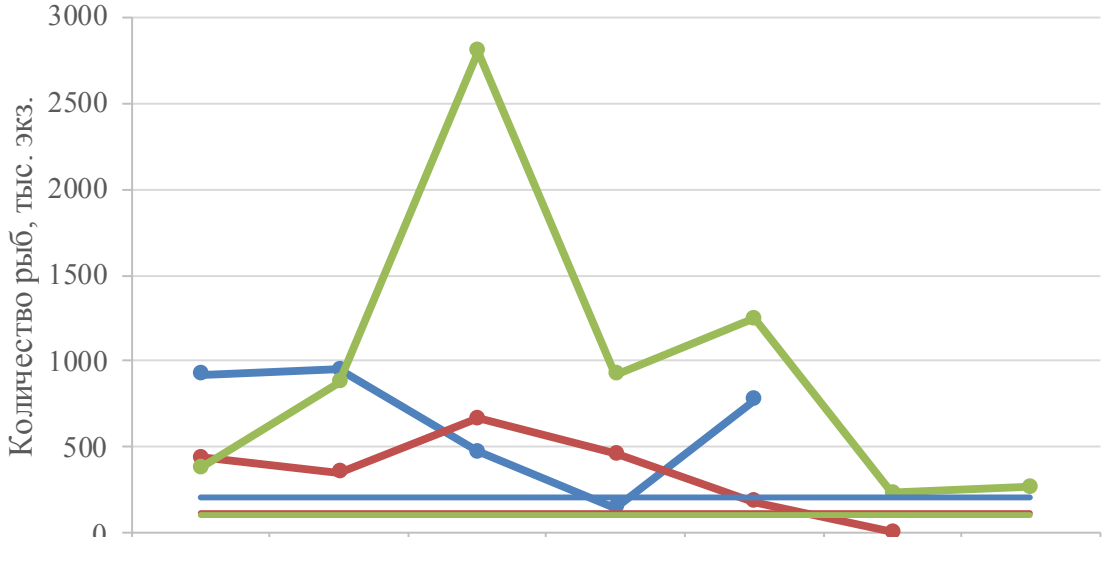


Fig.1.3 — Pink salmon spawners escapement in rivers Ozernaya, Koshegochek, Golygina, Opala, Kol and Vorovskaya in odd years in 2001-2017 (escapement goals for each river are marked as a horizontal line of corresponding color)



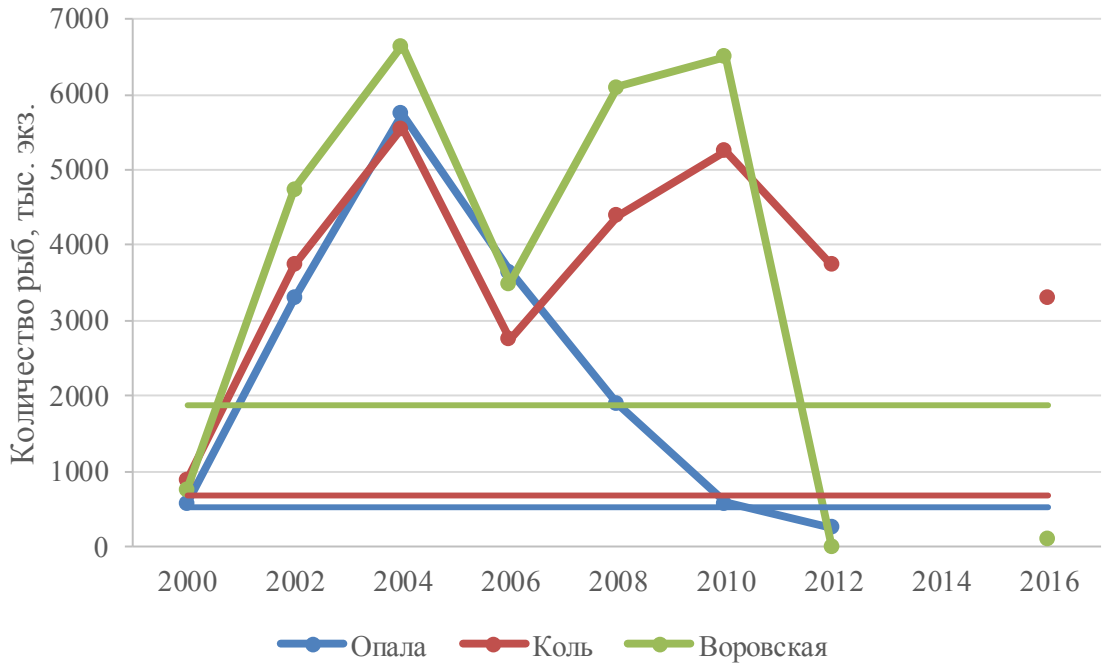


Fig 1.4 — Pink salmon spawners escapement in rivers Ozernaya, Koshegochek, Golygina, Opala, Kol and Vorovskaya in even years (escapement goals for each river are marked as a horizontal line of corresponding color)

It is clearly seen through the pictures (Fig.1.3) and tables (Table 1.3) that for this period only once in 2005 the number of escaped spawners in weak reproduction line has exceeded the optimum level. This was the maximum of Pink salmon run of odd-year reproduction line for the period of 2001-2017. In 2003-2004 the escapement level was close to the optimum level. In all other years Pink salmon of weak harvest year were lower the escapement limits.

Table 1.3

Optimum Pacific salmon spawners escapement into some Kamchatka rivers, thousand spawners

River	Pink salmon		Chum salmon	Silver salmon
River	Pink salmon	Chum salmon	Silver salmon	River

Vorovskaya	1868,0	862,0	56,4–72,8	20,2–23,6
Kol	667,0	308,0	11,8–26,5	10,2–15,0
Opala	512,0	236,0	95,8–113,8	13–20
Golygina	107,0	49,0		
Koshegochek	115,0	53,0	7,6–9,1	1,54–2,71
Ozernaya	211,0	97,0	5–6,3	0,94–2,64

In 2017 the aerovisual surveys were conducted only in Kol and Vorovskaya rivers. The conducted research in Kol river counted 625 thousand Pink Salmon spawners that is higher than optimum limit reference points. But taking into account the restricted format of research there is a reason to presume that Pink salmon escapement in Kol river was higher.

Pink Salmon stock in Vorovskaya river accounted for 231 thousand spawners that according to the target escapement goals is almost 4 times lower than the optimum level. But in this case it is necessary to bear in mind the chance of an incomplete count of spawners.

In general the escapement trend in the West Kamchatka rivers in 2017 was rather stable. But there is a need to extend aerovisual surveys in the West Kamchatka spawning grounds. In this regard those companies undergoing an annual MSC certification audit are mostly interested in these surveys.

In general despite some shortage of direct information from spawning grounds we presume that Pink salmon stock of odd years (weak harvest) in Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya and Kol rivers in 2017 was within the positive trend. This is proved by the similar escapement dynamics during the last 15 years.

Even-year salmon stock is also rather stable as in most cases it exceeded optimum levels (Fig. 1.4, Table 1.3). But unfortunately, in the recent years (2014 and 2016 years) there was a shortage of information about escapement. This requires to extend aerovisual surveys in the mentioned rivers basins for Pink Salmon of even-year reproduction line in 2018.

CHUM SALMON

The overall number of Chum salmon spawners in the rivers for a 15 year period is characterized by a regressive dynamics. From 2001 to 2014 Chum salmon escapement has dramatically decreased from 400 thousand to 35 thousand spawners (Fig. 1.5). The data on Chum salmon escapement in 2015 covered only Opala river, in 2016 – Kol and Vorovskaya rivers, 2017 – Kol, Vorovskaya and Opala rivers. The detailed data on Chum salmon escapement in the West Kamchatka rivers in 2001-2017 is presented in Fig. 1.6 and table 1.4.

Opala and Golygina rivers have a common estuary forming one river system that is why Chum salmon spawning in these rivers is assessed as one stock. Spawning population of Chum salmon in these rivers is considered stable. Except a three year maximum level in 2005-2007 the average escapement in 2001-2016 was 67 thousand that is considerably lower than target escapement goals (95,8-113,8) needed for the extended recovery of Chum salmon stock (Table 1.3.).

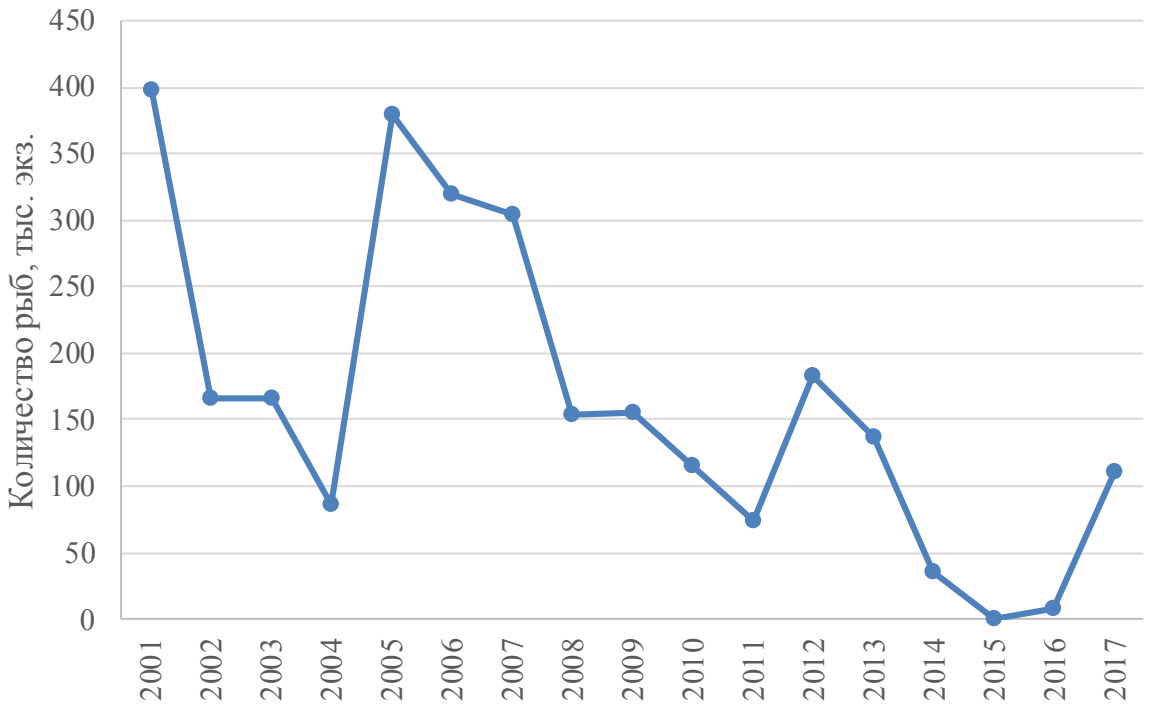
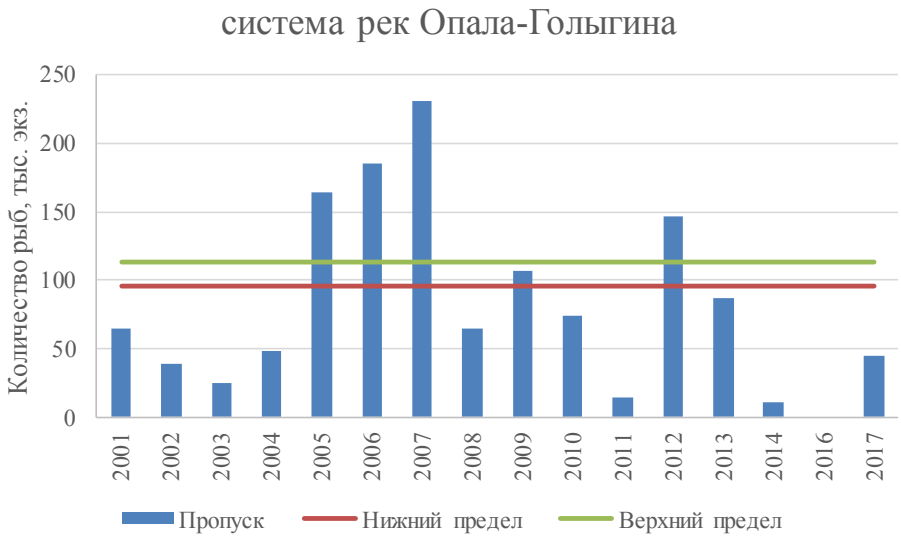
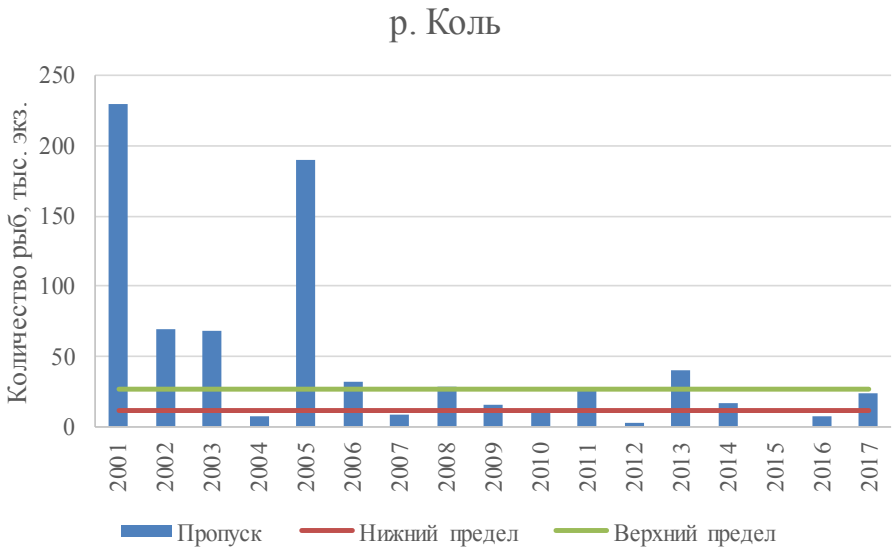


Fig. 1.5 — Overall counted Chum salmon spawners in Ozernaya, Kosegochek, Golygina, Opala, Kol and Vorovskaya river in 2001-2017.

In 2017 aerovisual surveys were conducted only in Opala river basin. Due to the shortage of funding early Chum salmon as the most abundant one was the target for this survey. Spawning grounds in the midstream of the main riverbed and in the tributary of Savan river, where the early Chum salmon spawning groups are located, were surveyed on July 18 (Fig.1.1). The aerovisual survey showed 45 thousand Chum salmon spawners in Opala river. The limited format of surveys does not allow to give an objective and complete assessment of Chum salmon spawners stock in Opala-Golygina rivers. It is obvious that the spawners number is higher than the assessed one but without the systematic full-format surveys it is impossible to give an adequate assessment of Chum salmon stock.





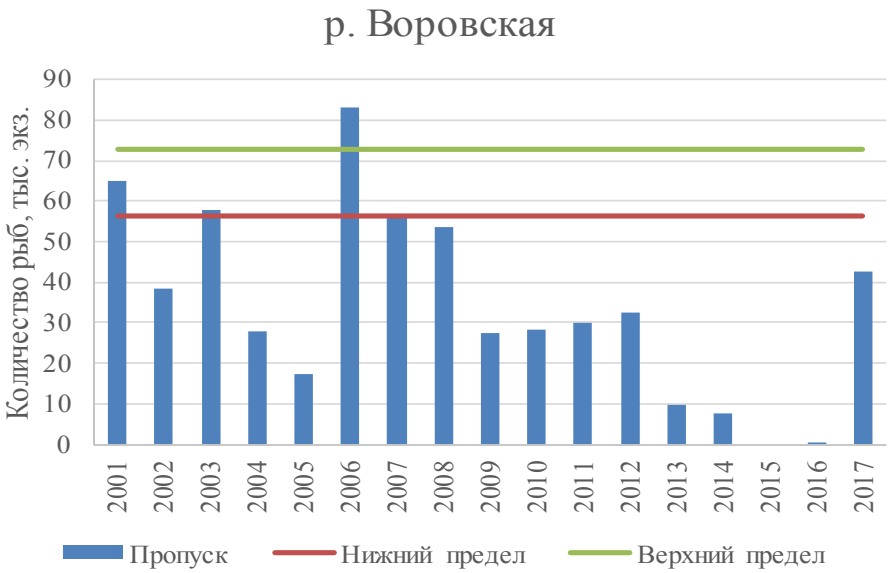


Fig. 1.6 — Chum salmon escapement dynamics in Golygina, Opala, Kol and Vorovskaya in 2001-2017 (escapement goals for each river are marked as a horizontal line for upper and lower limits)

Table 1.4

Counted Chum salmon spawners in the spawning grounds of some West Kamchatka rivers in 2001-2017, thousand spawners

River	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ozernaya	31,5	13	7,25	1	3,3	5,25	7,25	5,8	3,1	1	1	–	–	–	–	–	–
Koshegochek	6,75	6,5	7,25	1,5	5,15	13,5	1,8	–	1,75	1,55	–	–	–	–	–	–	–
Opala-Golygina	64,5	39,5	25	48	164	185	230,5	65,2	107,5	74,25	15	146,55	87,594	11,1	0,19	–	44,6
Kol	230	69	68	7,25	190	32	8,75	28,5	15,5	9,5	27,5	3,15	39,895	16,5	–	7,5	23,5
Vorovskaya	65	38,5	58	28	17,5	83	56	53,5	27,5	28,5	30	32,5	9,59	7,75	–	0,5	42,6

The most favorable conditions for Chum salmon reproduction are in the river Kol where the annual Chum salmon escapement correlates with the escapement goals. In 2017 Chum salmon escapement was assessed as 23,5 thousand spawners that is within optimum level (Table 1.3.).

For Vorovskaya river the maximum Chum salmon escapement level was 83 thousand spawners (2005). The escapement number in 2001-2008 was estimated as 50 thousand spawners and at the average corresponded to the optimum level (table 1.3). After 2008 the number of Chum salmon spawners in the spawning grounds did not exceed 35 thousand spawners. This is twice lower than the optimum level of 56,4–72,8 thousand spawners. In 2017 the Chum salmon escapement in 2017 was 42,6 thousand spawners that is higher than long-term average annual numbers counted since 2001. From this perspective the spawning escapement in 2017 could be close to the low limit of optimum level.

In general we can state a positive tendency for Chum salmon spawning in Opala, Golygina, Kol and Vorovskaya river in 2017 compared to 2014-2016 years.

RED SALMON

Red salmon fishery is mainly concentrated in the Ozernaya river (West Kamchatka coast). That is why Red salmon spawning stock assessment is conducted annually since XX century. According to the data from fishing weir in the estuary of Ozernaya river (observation point of KamchatNIRO) Red salmon spawners escapement in the Kuril lake in 2017 was **2350 thousand spawners** that almost 1,5 times exceeded the optimum level — **1500 thousand spawners (min–max — 1300–1800 thousand spawners).**

The Red salmon escapement dynamics in Koshegochek, Golygina, Opala, Kol and Vorovskaya rivers since 2000s shows a negative trend. The Red salmon stock was noticeably increased in 2005-2007, when Red salmon population changed from 124 to 214 thousand spawners (Fig. 1.7). In the next years Red

salmon stock on average accounted for 47 thousand spawners. Since 2015 Red salmon stock has not been assessed, and the presented statistics corresponds to the period of Pink and Chum salmon assessments.

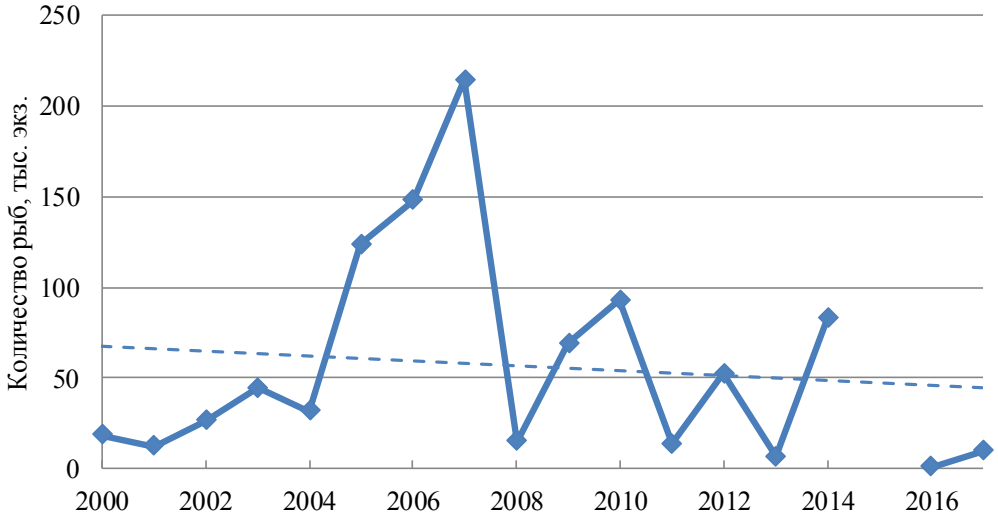


Fig. 1.7 — Overall counted Red salmon spawners in Kosegochek, Golygina, Opala, Kol and Vorovskaya river in 2000-2017.

In 2017 the direct assessment of Red salmon spawners escapement was conducted in Opala river (1,9 thousand spawners) and Vorovskaya river (5,9 thousand spawners) (Fig. 1.8).

In Opala river basin Red salmon assessment was conducted at the same time with early Chum salmon assessment (18 July) that corresponds to the early Red salmon spawning season and in general does not give an objective assessment of spawners escapement to the river basin. It should be noted that since 2000s Red salmon escapement only in two cases reached the necessary optimum level.

According to the aerovisual survey data Red salmon escapement in Vorovskaya river in 2017 was at the lower limit of the optimum level. Besides, taking into account that the aerovisual track scheme had a limited format it is obvious that that Red salmon stock was bigger. Thus, 2017 Red salmon escapement level can be considered to be at the optimum level.

Red salmon spawners stock in 2001-2017 presented in more details in the Table 1.5.

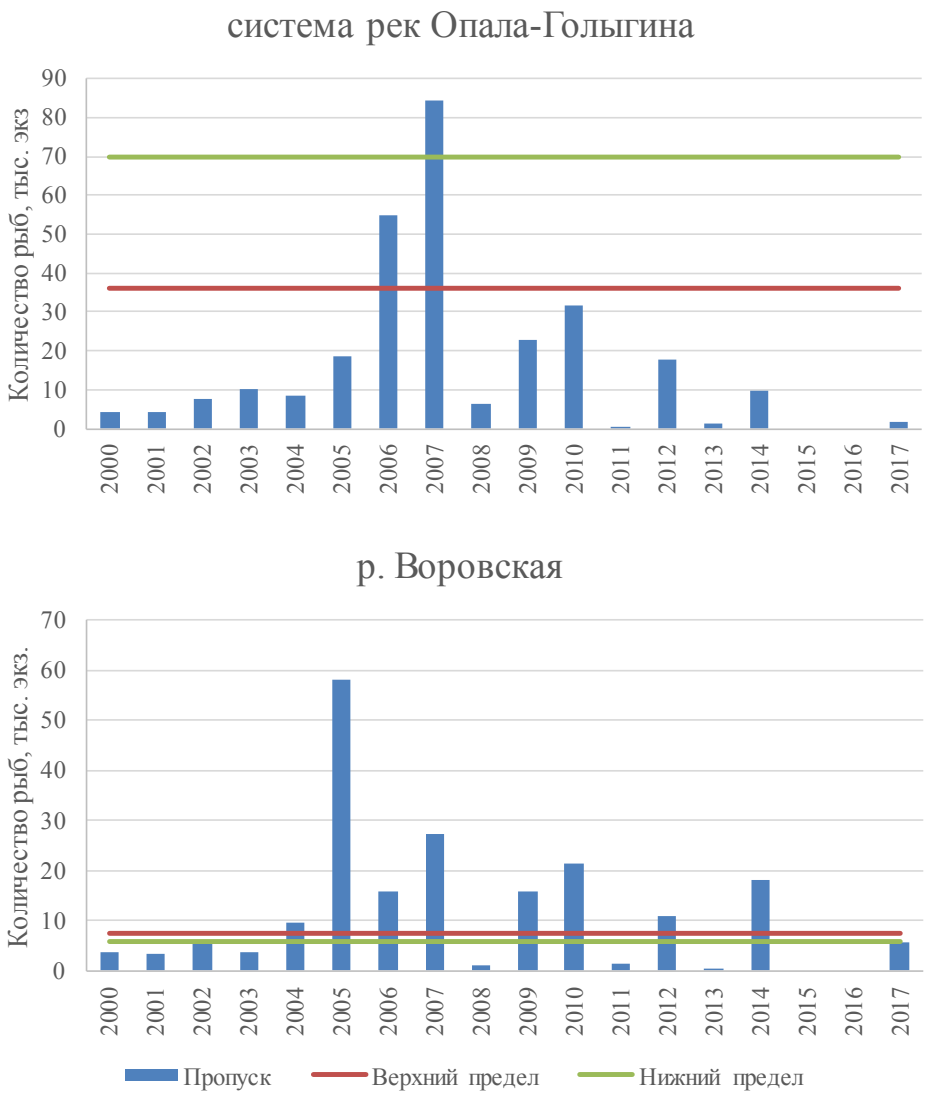


Fig 1.8. Red salmon escapement dynamics in Opala and Vorovskaya in 2000-2017 (escapement goals for each river are marked as a horizontal line for upper and lower limits)

Table 1.5

Counted Red salmon spawners in some West Kamchatka rivers in 2001-2017, thousand spawners

RIVER	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ozernaya	2110	2708,5	2243,5	1333,5	1565	1250	5035	1114	1299	1200,5	1753,5	1972	1681	1650,15	1750	1826	2350
Koshegochek	0,45	0,75	3,35	0,415	1,35	2,5	2,4	–	1,4	2,15	–	–	–	–	–	–	–
Opala-Golygina	4,15	7,55	10,1	8,45	18,45	55	84,5	6,3	22,65	31,85	0,45	17,6	1,33	9,97	–	–	1,9
Kol	0,27	4,75	16,75	4,4	27,5	19,5	15,5	1	6,25	5,25	11	5,95	3,75	44,75	–	0,55	–
Vorovskaya	3,35	5,8	3,9	9,75	58	16	27,5	1,25	16	21,5	1,5	11	0,12	18,05	–	–	5,87

SILVER SALMON, KING SALMON AND MASOU SALMON

Due to the lack of funding aerovisual surveys on Pacific salmon escapement in Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya and Kol river were not conducted in 2017.

The aerovisual surveys conducted in 2017 show Pacific salmon stock increase in Ozernaya, Kol, Vorovskaya and Opala rivers. Pink salmon stock in particular greatly increased compared to the odd-year reproduction line. Chum salmon stock increased as well. Ozernaya Red salmon escapement exceeded the optimum level, but did not reach the critical level corresponding to the overstock of the spawning ground.

Still there is a shortage of aerovisual surveys on Pacific salmon spawning in West Kamchatka rivers conducted regularly and systematically. Taking into account that most of the river basins are included into MSC program, it is desirable to extend aerovisual surveys on Pacific Salmon spawning stock in the mentioned water basins.

Chapter 2. Demonstrate the total catch of all West Kamchatka Fisheries in 2017 (indicate the name of the companies, each Pacific Salmon species and fish escapement points)

In this report we used spawning forecasts for Pacific salmon in Kamchatka kray prepared by KamchatNIRO in 2018 [1-6].

In 2017 spawning season in the West Kamchatka coast 51,488 thousand Pacific salmon were commercially caught that is 21% of the total Kamchatka catch. The main catch goes to Kamchatka-Kuril subzone – 72%. In West-Kamchatka subzone about 28% of the total catch in this region was caught.

Red salmon was dominant last fishing season. The fishery in Kamchatka-Kuril subzone was based on Red salmon stock of Ozernaya and Bolshaya rivers. 26,450 thousand Red salmon spawners were recommended for catch in 2017. The

next was Pink salmon with recommended catch of 20,0 thousand spawners. Recommended catch for Chum salmon –13,014 thousand spawners (first forecast). During the spawning season 1 correction was made and justified: increase Chum salmon catch by 2,5 thousand spawners in West Kamchatka. The potential Silver salmon catch was 5,852 thousand spawners, King salmon – 0,036 thousand spawners and Masou salmon – 0,008 thousand spawners . Total catch in West Kamchatka was spread as follows: Red salmon – 44,5%; Chum salmon– 25,9%; Pink salmon – 20,5%; Silver salmon – 9,1% (Fig. 2.1). King salmon and Masou salmon catch was 0,05% and 0,002% respectively.

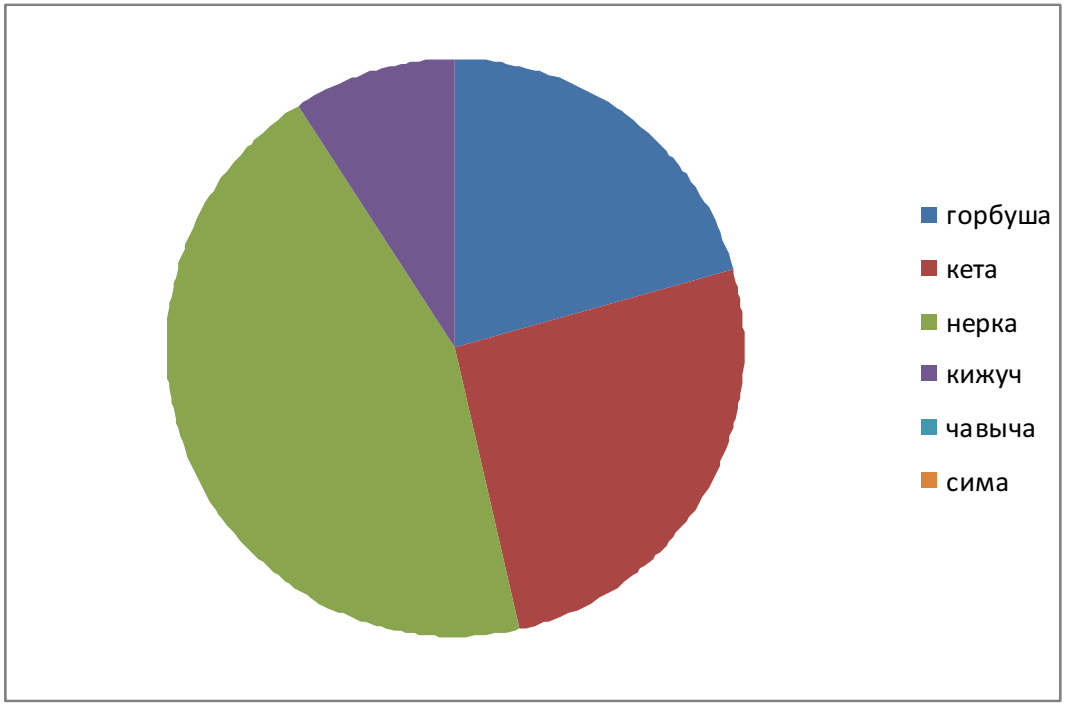


Fig 2.1 — Pacific Salmon distribution in the total West Kamchatka catch in 2017

As in the previous years in the West Kamchatka coast Pacific salmon was caught by 5 types of fisheries: industrial and coastal, sport and amateur, traditional, artificial propagation and scientific. The main fisheries are industrial and coastal with 49,993 thousand MT catch (97,1% of all catch), the second by volume was traditional fishing — 1,250 thousand MT (2,4%), sport and amateur 0,193 thousand MT (0,4%), artificial propagation — 0,038 thousand MT (0,08%) and scientific fishing – 0,014 thousand MT (0,03%) (Fig. 2.2).

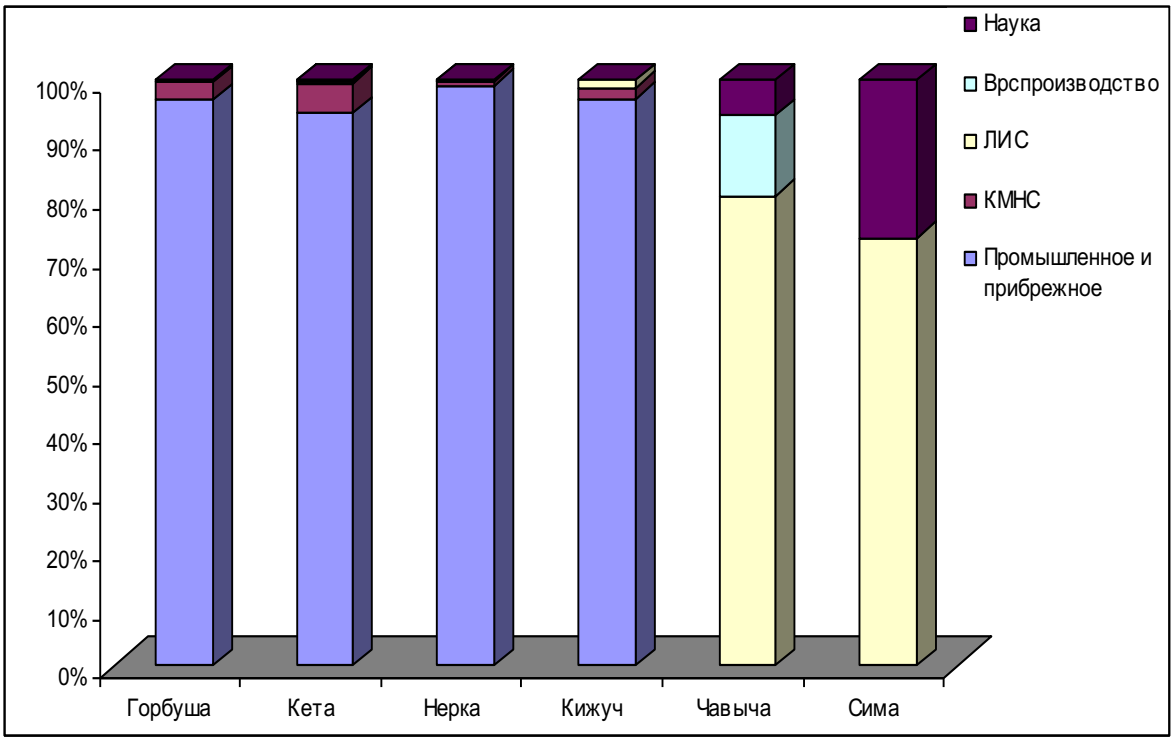


Fig. 2.2 — Correlation between various Pacific salmon fisheries in West Kamchatka

The Pacific salmon catches in the sea and river fishing plots in the West Kamchatka coast were almost similar: 25,9 thousand spawners — sea, 25,6 thousand spawners — river. As for the species distribution: 65% Pink Salmon and 57% Chum Salmon were caught in the sea plots, and about 60% Red Salmon and 52% Silver Salmon in river plots (Table. 2.1).

Table 2.1

Pacific Salmon catch in the sea and river fishing plots in West Kamchatka in 2017

Subzones		**Pink**	**Chum**	**Red**	**Silver**	**King**	**Masou**
WEST-KAMCHTKA	sea	3038,06	2674,48	573,73	1502,05	–	–
	river	1277,23	2741,75	1076,48	1489,25	6,28	0,10
KAMCHATKA-KURIL	sea	3842,19	4963,77	8573,71	738,89	–	–
	river	2393,38	2956,70	12691,42	930,46	17,69	0,70

PINK SALMON

In 2017 odd year run (weak harvest) was expected. The forecast was based first of on all young salmon population assessment conducted by trawl survey conducted by «TINRO-Centre» in fall 2016 and on results of genetic differentiation. According to our assessment, young Pink salmon population accounted for 400 (377) million fishes (k=0,4) and was supposed to correspond to Pink salmon return as of 82 million spawners that is around 100 thousand MT of catch. The genetic differentiation shows a similar correlation between north and south Pink salmon groups in the Okhotsk sea in 2015. Based on this data West Kamchatka Pink salmon stock recovery in 2017 was 26 million spawners, and the recommended catch volume was 20 thousand MT. Actual catch of Pink salmon in West Kamchatka was about 10,5 thousand MT, and the total Pink salmon run was estimated as 12 million spawners that is to say the run and catch were twice lower than expected.

CHUM SALMON

Nowadays Chum salmon stock in the West Kamchatka is at the relatively high level and corresponds to that of the 50s of XX century.

In general Chum salmon run in 2017 can be characterized as rather high. According to the official statistics the actual catch was 13,3 thousand MT among which 5,4 thousand MT were caught in West-Kamchatka subzone; 7,9 thousand MT – in Kamchatka-Kuril subzone. The accuracy of forecast was about 102%.

The space distribution analysis in 2017 in West Kamchatka coast showed that the majority of Chum salmon was caught in Kikhchik-Bolshaya river group (about 4272 MT). More than 2795 MT was caught in Opala-Ozernaya river group. 689 MT – Kol-Pympta river group. In the north Lesnaya-Belogolovaya rivers Chum salmon catch accounted for 1943 MT. In Icha-Vorovskaya – more than 2870 MT.

Chum salmon catch dynamics in West Kamchatka and Kamchatka-Kuril subzones was a little bit different. Chum salmon catching season began in the first decade of June in the north group of rivers Lesnaya – Belogolovaya in West Kamchatka subzone, and in Tigil river in particular, where early Chum is caught. The first catch of Chum salmon in Icha, Oblukovina-Vorovskaya began in the middle of July. Chum salmon catch in Kamchatka-Kuril subzone began in the beginning of June (02.06) and the first catch was in Opala-Ozernaya rivers. The maximum catch in West-Kamchatka subzone was observed from July 31 to August 5, when 900-1200 MT of Chum salmon was caught in 5 days, so on average about 1000 MT. In this period the catch in Kamchatka-Kuril subzone varied from 900 to 2400 MT, in average 1500 MT. Later the catch volume started decreasing in both subzones and in the beginning of September the average catch was about 100 MT in 5 days.

RED SALMON

The main stock of Red salmon in the West Kamchatka subzone is concentrated in Tigil region. First of all this is Chum salmon in Palana river that constitutes more than 45% of the whole Red salmon run in the this subzone. Some years usually with a low waterway the catch volume reaches 50-60%. In 2017 the commercial catch accounted for 30% that is equal to 113 thousand spawners (304,6 MT) at the average escapement level of 259, thousand spawners.

According to the 2017 forecast, the total Red salmon run of 903 thousand spawners was expected in the West Kamchatka subzone. The actual return was 856,7 thousand spawners or 95% of the recommended catch.

Other West Kamchatka subzones where Red salmon spawns were divided into 2 groups – main and secondary. The main group includes: Voyampolka, Tigil, Khayryuzova, Icha, Oblukovina, Krutogorova, Kolpakova and Vorovskaya.

The 2017 forecast predicted 51,6 thousand Red salmon spawners would come to spawn in Vorovskaya river. The actual catch was 44,7 thousand spawners in 2017, and the total run – 50,5 thousand spawners.

In Kamchatka-Kuril subzone the first Red salmon was caught in Ozernaya river on the 24th of June. The first catch in the sea fishing plots was on the 27th of July.

The total Red salmon catch in Ozernaya river accounted for 19981 MT. The mature spawners accounted for 10314 thousand spawners or 101,7% of the expected recommended catch (10140 thousand spawners). Coast (total) catch was 93,4 % of the expected recommended catch.

SILVER SALMON

In Kamchatka Silver salmon habitat can be found almost in all large water basins, mostly in the west coast – from Palana river in the north to Kambalnaya river in the south. The biggest stock is in Bolshaya river and in the central-west region – Vorovskaya, Krutogorova, Kol, Pymta, Kikhchik. Bolshaya river is one of the main spawning grounds for Silver salmon. More than 21% of spawning grounds preferred by Silver salmon in the west coast are located in this river basin.

In the last decade West-Kamchatka Silver salmon stock has been at the high level and reached it maximum level in 2014-2015. In 2016-2017 there was some decrease in Silver salmon spawning run and catch in West Kamchatka. However, it is at the relatively high level.

According to the forecast, the expected Silver salmon catch in West Kamchatka coast was estimated as 5852 MT. Silver salmon is primarily caught in the basin of Bolshaya river and adjacent sea water area where about 623,6 MT (including sea seines) or around 58,2% of total catch in Kamchatka-Kuril subzone.

The actual Silver salmon catch in West Kamchatka coast accounted for 4660 MT or 80% of the forecast expectations.

The peak Silver salmon run in most west coast regions in 2017 began as usual – the end of the second, beginning of the third decade of August. Silver salmon peak was between 25 August and September 10. But it should be noted that that Silver salmon run was big enough for catching in the end of July – beginning of August: by August 6, 128 MT was caught.

KING SALMON

Since 2010 commercial catch of King salmon spawners in the rivers has been stopped. King salmon is caught only for scientific purposes, and also for sport and amateur fishing or artificial propagation. In 2017 36 MT of King Salmon was recommended to catch by these types of fisheries, including West-Kamchatka subzone – 11 MT, Kamchatka-Kuril – 25 MT. Actual catch volume: West-Kamchatka – 6, 275 MT, quota use – 57% and in Kamchatka-Kuril subzone – 17, 680 MT, quota use -71%

About 60% King salmon in West Kamchatka coast was caught in Bolshaya river. In 2017 12,543 MT King salmon was caught. In Bolshaya river basin King salmon was caught for scientific purposes and artificial propagation. Besides, amateur and sport fishing was allowed in river fishing plots from June 1st.

The beginning of King salmon spawning run in Bolshaya river began in the first days of June. The peak run lasted from 05 to 25 June, after July 20 the run drastically decreased.

In other Ust-Bolsheretsk rivers amateur and sport fisheries caught 3,141 MT of King Salmon.

MASOU SALMON

According to KamchatNIRO forecast in 2017 the recommended Masou salmon catch in West Kamchatka coast was 8 MT. Taking into account that the Masou salmon spawning run coincides with the King salmon, that is why the by-catch of this species during sport and amateur fishing is inevitable. In this regard for legal catching and in the official catching statistics, 4,85 MT of this salmon species was allowed for sport and amateur fishing. The total catch of Masou salmon in 2017 in the coast accounted for 0,793 MT, among which 0,58 MT was caught by the sport-amateur fisheries.

Vityaz-Avto and Delta Fisheries

There are 22 salmon fisheries in Ozernaya, Koshegochek, Golygina, Opala, Vorovsksya and Kol. The list of companies is as follows: AO “Ozernovskiy RKZ #55”, OOO “Bolsheretsk”, OOO “Vityaz-Avto”, OOO “Rybokombinat Zapadniy”, OOO “Rybholkam”, OOO “Alyk”, RA “Kolkhoz Krasniy truzhennk”, OOO “Poseydon”, OOO “Delta”, OOO “Zyud”, OOO “Loid-Fish”, OOO “Oktyabskiy rybokombinat”, OOO RPF “KamNORis”, OOO Artel “Narody Severa”, OOO “Dary Kamchatki”, OAO “Kolkhoz Oktyabr”, OOO “Kristall Losos’, OOO “Skit”, OOO “Kristall”, OOO “Kristall Fish”, Pymta, Kamber.

Taking into account the confidentiality we provide information only concerning JSC “Vityaz-Avto” and its subsidiary company JSC “Delta” which both present one Pacific Salmon fishery unit in Ozernaya, Koshegochek, Golygina, Opala, Vorovskaya and Kol rivers.

Vityaz-Avto and Delta companies are involved in industrial and coastal fishing. Besides, Vityaz-Avto used sport and amateur fishing plots in Kol river in 2017. River fishing plots are located in Kol river, Bolshaya Vorovskaya, Opala, Koshegochek, Golygina and Ozernaya. Sea fishing plots are located in pre-estuary zones of the water basins.

4 Pacific salmon species are targeted for industrial fishing: Pink salmon, Chum salmon, Red salmon and Silver salmon. The catch volume of these companies in 2017 accounted for 16% of the total industrial and catch in West Kamchatka coast. These companies caught 26% of Red salmon in West Kamchatka, Pink salmon – 9,5%, Chum salmon – 7% and Silver salmon - 5 %.

Vityaz-Avto and Delta fisheries catch volume in the sea and river fishing plots in 2017 are shown below (table 2.2 and 2.3).

Vityaz-Avto caught 1,5 MT of Silver salmon and 1,0 MT of King salmon in sport and amateur fishing plots in 2017.

Table 2.2

Pacific Salmon catch by JSC “Vityaz-Avto” and “Delta” in 2017

COMPANY	№ fishing plot	Location	Catch, MT			
			PINK	CHUM	RED	SILVER
VITYAZ-AVTO CO., LTD"	60	Okhotsk sea	10,74	5,92	0,36	22,84
	77	Okhotsk sea	18,16	5,12	0,91	0,00
	78	Okhotsk sea	2,67	7,40	0,00	28,95
	81	Okhotsk sea	34,94	36,06	4,34	23,43
	687	Rive Vorovskaya	6,98	7,74	1,04	10,67
	90	Okhotsk sea	184,75	57,85	4,85	31,54
	1123	Okhotsk sea	58,91	22,20	0,52	0,00
	697	River Kol	243,27	69,48	6,40	96,27
	189	Okhotsk sea	31,50	15,60	35,80	0,00
	190	Okhotsk sea	53,90	35,60	22,40	0,00
	191	Okhotsk sea	57,40	22,70	43,40	0,00
	197	Okhotsk sea	44,60	25,50	608,70	0,00
	203	Okhotsk sea	38,90	19,00	367,30	0,00
	204	Okhotsk sea	23,70	2,50	832,00	0,00
	746	River Golygina	0,00	7,35	0,00	0,00
	747	River Koshegochek	0,31	8,00	0,00	0,00
	752	River Ozernaya	3,17	107,09	2551,91	7,27
DELTA CO., LTD	177	Okhotsk sea	9,49	50,92	41,59	0,65
	178	Okhotsk sea	9,74	52,82	40,80	0,65
	179	Okhotsk sea	11,58	42,13	22,71	0,62
	180	Okhotsk sea	11,78	42,39	21,72	0,58
	181	Okhotsk sea	12,34	41,54	22,20	0,59
	184	Okhotsk sea	18,34	77,82	77,29	0,47
	198	Okhotsk sea	37,00	13,50	295,00	0,00
	740	River Opala	13,65	82,30	21,00	0,40
	755	River Ozernaya	25,70	4,52	1033,40	0,00

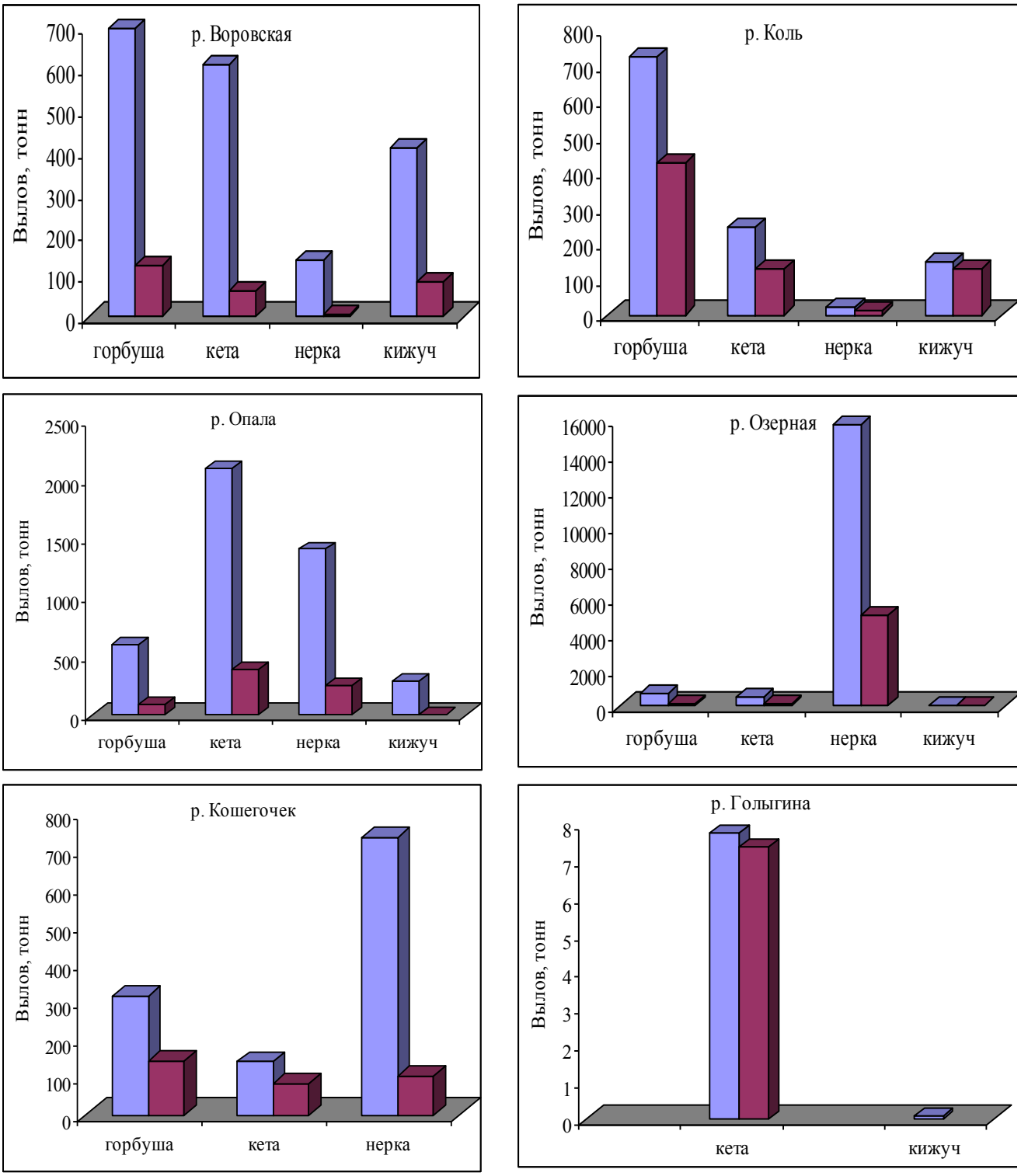


Fig. 2.3 — JSC “Vityaz-Avto” and “Delta” salmon catch in West Kamchatka rivers in 2017

Vityaz-Avto and Delta Salmon fisheries share in total industrial and coastal catch in all sea and river fishing plots in West Kamchatka coast in 2017 accounted for: Vorovskaya river – 14,6%; Opala river – 16,5%; Koshegochek river – 27,5%;

Ozernaya river – 31,6%; Kol river – 60,8%; Golygina river– 93,6%. The river catch distribution is as follows:

1) Vorovskaya river: Pink salmon – 17,6%, Chum salmon – 9,8%, Red salmon – 4,8%, Silver salmon – 20,3%;

2) Opala river: Pink salmon – 14,3%, Chum salmon – 18,5%, Red salmon – 17,5%, Silver salmon – 1,4%;

3) Koshegochek river: Pink salmon – 45,5%, Chum salmon – 58,2%, Red salmon – 13,7%;

4) Ozernaya river: Pink salmon – 19,3%, Chum salmon – 28,6%, Red salmon – 32,2%, Silver salmon – 44,0%;

5) Kol river: Pink salmon – 59,2%, Chum salmon – 51,7%, Red salmon – 52,5%, Silver salmon – 84,3%;

6) Golygina river: Silver salmon – 94,8%.

Chapter 3. Provide data on Ozernaya river Red Salmon stock and catch in 2016 and 2017 (spawners escapement, river/sea/total catch).

By the decision of Anadromous Fish Catch Monitoring and Controlling Commission Pacific salmon fishing season in Ozernaya river in 2016 and 2017 began from June 20. The first Red salmon in river fishing plots in Ozernaya river was caught on the 28th of June, 2016 and on the 24th of June, 2017. Salmon fishing by seines in the sea aquatoria from the fishing plot # 189 (including) and to the south of the fishing plot # 209 began from July 26 (2016) and July 24 (2017) (Fig. 3.1).

In the sea aquatoria adjacent to Ozernaya river 11 fishing plots were open. In Ozernaya river 10 river fishing plots were used.

Early Red salmon run to the Kuril lake (Ozernaya river) in 2016 and 2017 continued till July, 9-10. Early Red salmon in 2016 was estimated as 184,2 thousand spawners. Mature Red salmon catch in Ozernaya river estuary before this

period accounted for 151,2 MT. Early Red salmon run was assessed as 257,9 thousand spawners, commercial catch accounted for 28,6 % of the spawning run.

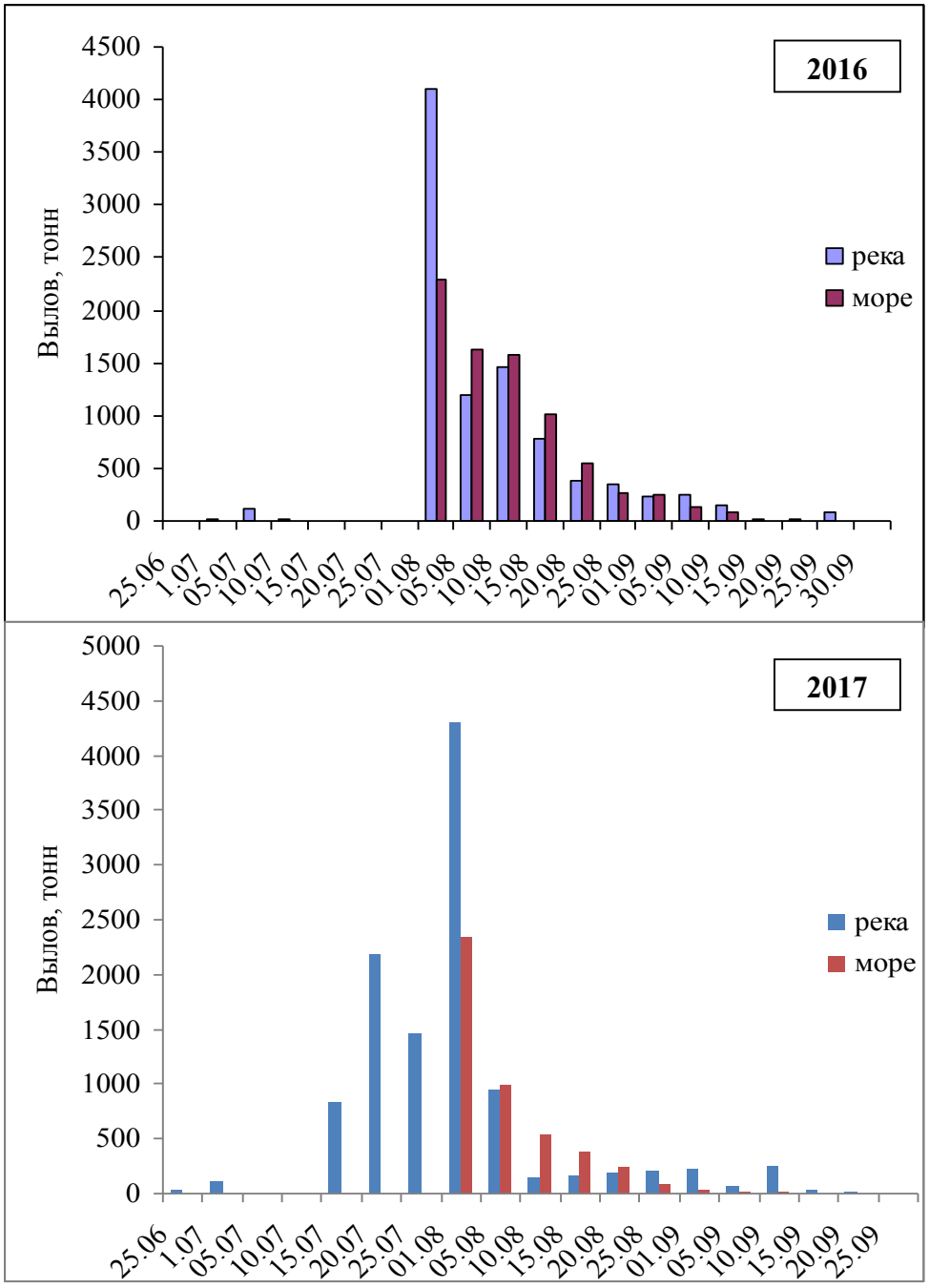


Fig. 3.1 — Red salmon catch in river and sea fishing plots in Ozernaya river on a 5 day schedule in 2016 and 2017

In 2017 mature Red salmon catch in Ozernaya river estuary before July 10 was 158,1 MT. Later late Red salmon came to spawn. The population of early Red salmon in 2017 was assessed as 149,5 thousand spawners. The total early Red

salmon run in 2017 was 270,4 thousand spawners and the commercial catch accounted for 44,7 % of the total run.

In 2016 the peak run began on July, 25 and continued till August,12. The highest peak occurred on August, 02. 2531,6 MT of Red salmon was caught in the sea fishing plots and in Ozernaya river on August, 02. For 19 days of the peak run fishermen caught 77,2% of the total Red salmon harvest in Ozernaya river that is 65,4 % of the total in 2016.

The beginning of the peak run in 2017 was on July, 19 that lasted till August, 04. The highest peak was on July, 31. 2478,6 MT of Red salmon was caught in the sea fishing plots and Ozernaya river together. For 17 days of the peak run fishermen caught 67,8% of the total Red salmon harvest or 52,4% of the total run.

Anadromous Fish Catch Monitoring and Controlling Commission set the escapement day schedule in Ozernaya river: 2 escapement days – 2 catching days. In 2016 fishing season there were 37 catching days, and in 2017 – 22 days. It should be noted that the commercial catch in those days when Red salmon was being caught in Ozernaya river, on average exceeded 94% (2016) and was about 93% (2017). This would not make possible the escapement of enough number of spawners to the spawning ground that is why it is in these escapement days that Red salmon escaped to the spawning ground.

Pacific salmon fishing season in Ozernaya region finished on the 26th of September, 2016. Ozernaya river coastal catch in 2016 accounted for 84,7 % of the coastal run.

In 2017 Pacific Salmon fishing in Ozernaya river finished on September, 20. Red salmon coastal fishing in Ozernaya river accounted for 88,2 % of the total run.

1826 thousand Red salmon spawners escaped to the Kuril lake in 2016 and in 2017 – 2350 spawners.

18598,6 MT Pacific salmon spawners were caught in the sea and river fishing plots in Ozernaya river in 2016. The dominant salmon was Red salmon –

16950,9 MT (91%). In 2017 16977,7 MT of all Pacific salmon species were caught. 15781,8 MT (93%) of Red salmon was caught (Fig. 3.2, табл. 3.1).

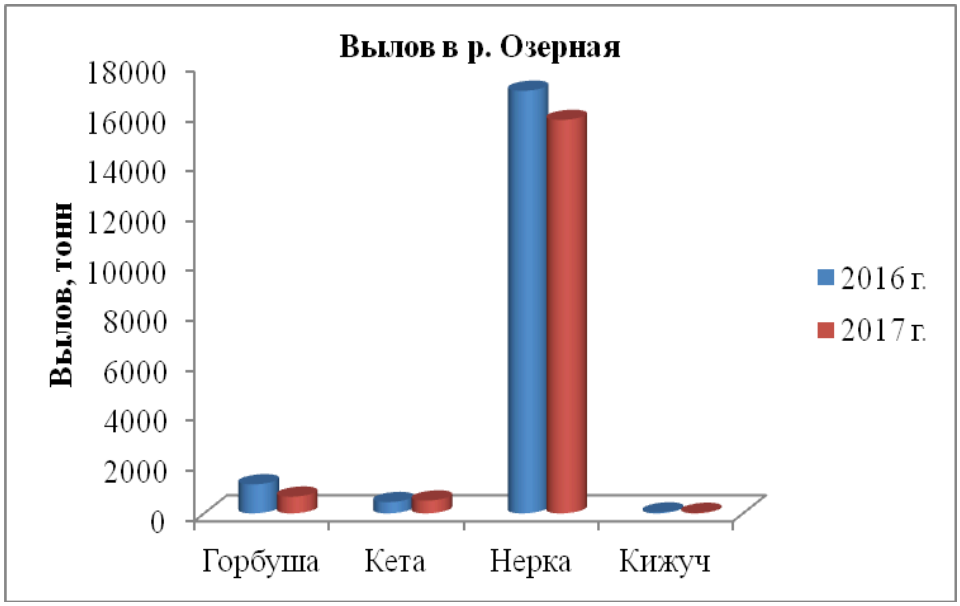


Fig. 3.2 — Total Pacific Salmon catch by all types of fisheries in Ozernaya river basin and its estuary zone in 2016 and 2017.

Table 3.1

Total Pacific Salmon Catch in the river and sea fishing plots in Ozernaya river basin and its estuary in 2016 and 2017.

Year	Fishing plot	Pink salmon	Chum salmon	Red salmon	Silver salmon	TOTAL
2016	Sea plot	848,8	217,0	7786,4	1,1	8853,3
	River plot	313,8	234,6	9164,6	32,3	9745,3
	TOTAL catch	**1162,6**	**451,6**	**16950,9**	**33,5**	**18598,6**
2017	Sea plot	384,9	209,0	4638,9	1,5	5234,3
	River plot	282,1	303,4	11142,9	15,1	11743,4
	TOTAL catch	**667,0**	**512,3**	**15781,8**	**16,5**	**16977,7**

Most of the catch has been done in the river fishing plots, about 52% of all Pacific salmon catch 2016, in 2017 – 69% (Fig. 3.3). Only Pink Salmon catch in the sea plots is higher than in the river – 73% in 2016 and 58% in 2017.

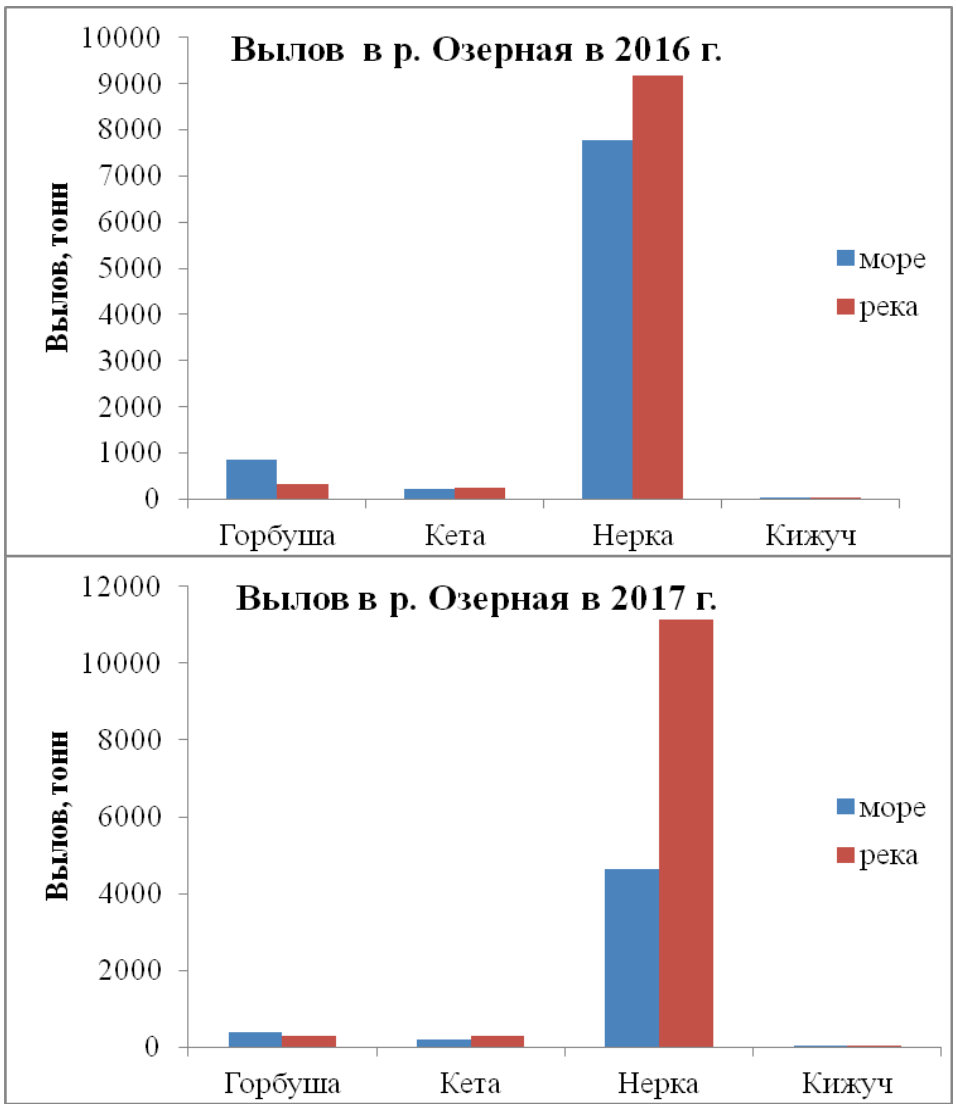


Fig. 3.3 — Pacific Salmon Catch by all fishing type in river and sea fishing plots of Ozernaya river.

Chapter 4. Provide summarized information on actions taken by Anadromous Fish Catch Monitoring and Controlling Commission in Kamchatka krai (Protocols) in 2017 and justification of actions in certified West Kamchatka fisheries.

Fish management regulations for West Kamchatka Fisheries were set up in 2017 fishing season.

The recommended Pacific Salmon fishing schedule in West Kamchatka and in target plots in West Kamchatka coast was as follows:

Fishing season opening:

West-Kamhatka subzone:

- Tigil region (excluding Palana river, Tigil river, Voyampolka river) from June, 01;
- Palana, Tigil, Voyampolka river from June, 20;
- Penzhinskiy and Karaginskiy regions from July, 15;
- Sobolevo and Bystrinskiy regions from July, 15;

Kamchatka-Kuril subzone:

- Sobolevo region from July, 15;
- Ust-Bolsheretsk region:
- River Ozernaya (west) from June, 20;
- River Opala from July, 1;
- sea aquatoria from the sea fishing plot № 189 (including) in the south to the fishing plot № 209 from July, 15 at the condition that not less than 500 thousand late Red salmon spawners escape to the Kuril lake;
- other water basins from July, 15.

The following escapement days schedule was recommended (week days, every week):

Rivers, lakes:

- in rivers, lakes (excluding Bolshaya river, Ozernaya (west) river, Opala) – Monday, Tuesday, Wednesday, every week.;
- in Ozernaya river (west) – June 22, 23, 26, 27, 30; July 1, 4, 5, 8, 9, 12, 13, 16, 17, 20, 21, 24, 25, 28, 29; August 1,2, 5, 6, 9, 10, 13, 14, 17, 18, 21, 22, 25, 26, 29, 30 August; September 2, 3, 6, 7, 10, 11, 14, 15, 18, 19, 22, 23, 26, 27, 30;
- in Opala river – July 03, 04, 07, 08, 11, 12; from 15 July – Monday, Tuesday, Wednesday, every week;
- in the aquatoria of Bolshaya river from its estuary to the fishing plot № 722 (including) – Monday, Tuesday, Wednesday, every week;
- in the aquatorium of Bolshaya river from fishing plot № 723 (including) and up current including its estuaries – Tuesday, Wednesday, Tuesday every week;

Sea aquatoria:

- in the sea fishing plots in West-Kamchatka and Kamchatka-Kuril subzones, excluding aquatorium from fishing plot № 189 (including) in the south to fishing plot № 209 (including) – Monday, Tuesday every week.

The Anadromous Fish Catch Monitoring and Controlling Commission made some corrections depending on the catching situation the (Table 4.1).

In Ozernovskiy region corrections were first of all targeted at maintaining the optimum escapement level in the Kuril lake (Ozernaya river). For example, in 2017 since late Red salmon escapement level to the Kuril lake (up to 500 thousand spawners) was not reached, fishing season in the sea aquatoria was postponed. With the further peak run of late Red salmon to Ozernaya river on July 20-21 and July 24-25 when the escapement level reached about 1,5 million late Red salmon spawners, the escapement days in Ozernaya river from 06 pm August, 02 were cancelled.

Besides, difficult meteorological situation in the aquatoria adjacent to the West Kamchatka coast made it impossible in certain cases to install net gears, escapement days were cancelled from July 31 in the sea fishing plots in West-Kamchatka and Kamchatka-Kuril subzones.

Table 4.1

Catch Regulating Actions taken by Anadromous Fish Catch Monitoring and Controlling Commission in 2017

№ Protocol and date	West Kamchatka Fishing Season
09 June 2017 № 7	In amendment of p. 3.4 of Protocol № 4 dated on 16.05.2017 : **West coast:** West-Kamchatka subzone: - Tigil region (excluding Palana, Tigil, Voyampolka rivers **with its estuaries**) from June 01; - Palana, Tigil, Voyampolka rivers **with its estuaries** from June 20. - Penzhinskiy and Karaginskiy regions form **July 15**; - Sobolevo and Bystrinsky regions from **15 July.**
23 June 2017 № 9	1.1. Regarding the change in the decision of the Commission dated on 16.05.2017 (p. 4.1 protocol № 4) **set escapement days** for industrial, traditional fisheries in Tigil**,** Voyampolka and Palana – **Monday, Tuesday every week.** 1.2. Regarding the change in the decision of the Commission dated on16.05.2017 (p. 4.6 protocol № 4) **cancel escapement days** in liman of Khayryuzova, Belogolovaya rivers from June, 26 (including fishing plots №№ 633-643).
11 July 2017 № 11	Considering the escapement level of late Red salmon lower than 500 thousand spawners in the Kuril lake, defined by p. 3.4 protocol dated on 16.05.2017 № 4, set that fishing in sea aquatoria from the fishing plot № 189 (including) in the south to the fishing plot № 209 should be suspended until the special instruction by Commission.
14 July 2017 № 12	2.2. Regarding the change in the decision of the Commission dated on 16.05.2017 (p. 4.1 protocol № 4) **set escapement days** for industrial fishing in Moroshechnaya, Belogolovaya rivers – **Monday, Tuesday every week.**
18 July 2017 № 13	Regarding the change in the decision of the Commission dated on 16.05.2017 (p. 4.1 protocol № 4) **for the period from Jul 24** set the escapement days for industrial, coastal fishing in the sea fishing plots №№ 42-45, 48-55, 1109-1113, 1091-1093 - **Wednesday, Thursday** every week, in the river fishing plots №№ 673-675 (Krutogorova plot), №№ 678-681 (Kolpakova river) - **Wednesday, Thursday, Friday** every week.
24 July 2017 № 15	**Open fishing season** of Pacific Salmon and char in the sea aquatoria from the sea fishing plot № 189 (including) in the south to the fishing plot № 209 (including) **from 00 AM July 25**.

26 July 2017 № 16	2.1. Cancel **escapement days** in the sea aquatoria in West Kamchatka and Kamchatka-Kuril subzones **for the period from July 31** until the special instruction by Commission. 2.2. Cancel **for the period July 31 till August 06 (including) escapement days** in rivers, lakes within Tigil, Sobolevo and Ust-Bolsheretsk regions. 2.4. Cancel **escapement days July 28 and 29** in Ozernaya river (west). For the period **from August 01** (including) set escapement days in Ozernaya river (west) – **Tuesday, Wednesday every week**.
2 August 2017 № 18	Cancel **escapement days** in Ozernaya river (west) **from 18:00 August 02** until the special instruction by Commission.
16 August 2017 № 21	***Set the unified catching volume*** for Chum salmon in all water basins in West Kamchatka and Kamchatka-Kuril subzones. Cancel the decision of the Commission dated on 26.07.2017 (p.2.1.№16) and renew from August 21 (including) earlier set escapement days schedule in the sea shore of West Kamchatka according to the decisions taken by p. 4.1 protocol № 4 dated on 16.05.2017, p. 1.2. Protocol № 9 dated on 23.06.2017, p.2 Protocol № 13 dated on 18.07.2017, p.1 Protocol № 15 dated on 24.07.2017.
27 August 2017 № 22	1. Due to VI Kamchatka kray festival "Preserve salmon TOGETHER" held on September 04-10 make a change in the escapement days schedule for industrial, coastal, traditional fisheries: а) in Bolshaya river basin from its estuary to the fishing plot № 722 (including) – **September 6,7,8** and cancel escapement days September 4 and 5; - in the aquatoria of Bolshaya river from the fishing plot № 723 (including) and upper stream, including its estuaries – **September 7, 8, 9** and escapement days September 5 and 6; б) – in the sea aquatoria from Kikhchik river estuary in the south to Opala river estuary (from the fishing plot № 183 including) – set escapement days September 6 and 7, cancel escapement: September 4 and 5.
4 September 2017 № 23	***Set unified catch for*** Silver salmon in the West –Kamchatka subzone. ***Set unified catch for*** Silver salmon in Kamchatka-Kuril subzone.
12 September 2017 № 24	1.1. **From 00 AM September,13** impose a ban on commercial, coastal, traditional, sport and amateur fishing except the fishing plot № 280 in Kamchatka Gulf designed for amateur and sport fishing. 1.4. From 00 AM September 13 set escapement days in Ozernaya river (west) – **Wednesday, Thursday every week**. 2.1. ***Set unified catch for*** Silver salmon in West Kamchatka and Kamchatka-Kuril subzone.
20 September 2017 № 25	1**. From** 00 AM September 22 impose a ban on commercial and traditional fishing, as well as traditional fishing without the designated fishing plot.

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