



ФЕДЕРАЛЬНОЕ АГЕНТСТВО ПО РЫБОЛОВСТВУ  
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ НАУЧНОЕ УЧРЕЖДЕНИЕ  
«ВСЕРОССИЙСКИЙ НАУЧНО-ИССЛЕДОВАТЕЛЬСКИЙ ИНСТИТУТ  
РЫБНОГО ХОЗЯЙСТВА И ОКЕАНОГРАФИИ»  
Камчатский филиал ФГБНУ «ВНИРО» («КамчатНИРО»)

Head of Kamchatka branch  
Federal State Budgetary Institution  
"VNIRO"

\_\_\_\_\_ N.Yu. Shpigalskaya

" \_\_\_\_\_ " \_\_\_\_\_ 2020

**REPORT (Contract No. 59- ПДД / 20- NIR dated 17.02.2020)**

Subject: “ Pacific salmon stock and fishery management analysis of West Kamchatka fisheries in Ozernaya river (sockeye salmon, chum salmon, pink salmon) and Opala (chum, pink salmon) for Delta LLC salmon fishery certification to MSC standards)

Project leader:  
Deputy Director of Research,  
Doctor of Science (Biology)

[signature] A.V. Bugaev

**Prepared by:**

Project leader: Deputy Director of Research, Doctor of Science (Biology)	<b>A.V. Bugaev</b> General guidance and edition
Head the laboratory	<b>O.V. Zikunova</b> Chapters 1 , 7
Head of the sector	<b>N.B. Artyukhina</b> Chapters: 4 , 5
Senior Researcher, Ph.D.	<b>M . R . Feldman</b> Chapters: 4, 6
Senior Researcher	<b>S.V. Shubkin</b> Chapters: 2 , 3, 8

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## INTRODUCTION

In relation to the certification of Delta salmon fishery to the standards of the Marine Stewardship Council (MSC), the required information on Pacific salmon stock and fishery management of West Kamchatka fisheries in Ozernaya and Opala was prepared. In addition, the report also provides information on fish conservation measures and reported cases of IUU fishing in the area where Delta fishery is located.

MSC Manual for issuing bodies states that the certification unit is “Fisheries or fish stocks (biologically distinctive unit) in combination with their fishing method (fishing tools, industry practice and management infrastructure)”.

Therefore, within the framework of MSC assessment, Delta Co., LTD fishery is defined as follows: 1) Target fish species: pink salmon *Oncorhynchus gorbuscha*, chum salmon *Oncorhynchus keta*, sockeye salmon *Oncorhynchus nerka* and coho salmon *Oncorhynchus kisutch*; 2) The geographical area (fishing area): the western coast of Kamchatka (rivers Ozernaya, Opala), the Sea of Okhotsk, as well as the administrative zone - Kamchatka-Kuril subzone - 61.05.4; 3) Fish stocks (fishing units): populations (local herds) of four species of Pacific salmon (pink salmon, chum salmon, sockeye salmon, and coho salmon) reproduced in the basins of above mentioned rivers.

**Research goal** — Pacific salmon stock and fishery management analysis in rivers Ozernaya (sockeye salmon, chum, pink almon), and Opala (chum, pink) in 2019.

### **Tasks:**

- 1) Description of any changes in fishery management system, in fishing areas and fishing plots, science and fishing industry management systems in 2019
- 2) Pacific salmon target escapement goals to evaluate  $\Delta$  efficiency of fishery management in the region
- 3) Provide data on escapement of Pacific salmon for MSC certified rivers in 2019
- 4) Update Appendix A (Table ‘Sockeye salmon spawning in Ozernaya river in 2019’)

5) Annual report on fishery management actions taken by Anadromous Fish Commission in 2019

6) Report on monitoring improvement measures in 2019 for sockeye salmon (excluding sockeye salmon harvest in Ozernaya river) and coho salmon, caught by Delta. Sockeye and coho salmon escapement data in the certified rivers

7) Law enforcement measures by SVTU and fishing companies to combat illegal fishing, including the scope of work and any violations in 2019

8) Aerovisual survey data on coho salmon and sockeye salmon escapement conducted in 2019, comparative analysis with the data of aerovisual surveys in 2016–2018

## **Chapter 1. Description of any changes in fishery management system, in fishing areas and fishing plots, science and fishing industry management systems in 2019**

In 2019 the most significant changes in the legislation (the current Russian fishing rules) that determine fishery terms in Kamchatka, were as follows:

1. Order of the Ministry of Agriculture of the Russian Federation from 25/7/2019 № 442 "On the conclusion of contracts on use of fishing plots in accordance with Articles 61, 63 - 65 of the Federal Law of 20 December 2004 of № 166-Ф3 " On fishery and preservation of aquatic biological resources " the term "fish catching plot (RPU)" was replaced by "fishing plot (RLU)";
2. Restrictions on the use of gillnets in the catch of Pacific salmon in Kamchatka, which were included in the current Fishing Rules for the Far Eastern Fisheries Basin (Order No. 267 of 05/23/2019) (hereinafter referred to as the Fishing Rules) by the Order of the Russian Ministry of Agriculture dated 06/04/2018 № 228, are currently valid.

At the same time, new Fishing Rules were adopted in 2019, which introduced a number of changes to the existing Fishing Rules, regulated by order of the Ministry of Agriculture of the Russian Federation No. 385 of 10.21.2013. Table 1.1 shows these changes, in terms of the fishing of Pacific salmon within the Kamchatka Territory.

As the new Fishing Rules were tested, many fishery owners and the citizens using the fish resources of the Russian Federation had a number of suggestions and comments on the revision of this document. Table 1.2 summarizes the current proposals for updating the new Fishing Rules approved at the KamchatNIRO Scientific Council in 2019–2020. In this case, a set of measures is considered to further improve legislation in the field of use and protection of salmon resources, both within the Kamchatka Territory and the Russian Far East as a whole.

In the field of scientific management of salmon fishing in Kamchatka, there were no significant changes in 2019. Federal control in this direction continues to

be carried out by the Kamchatka branch of the Federal State Budget Scientific Institution VNIRO (KamchatNIRO).

Table 1.1 - Changes in the terms of the Pacific salmon catch that were added in the Fishing Rules for the Far East fishery basin within the boundaries of the Kamchatka Territory in 2019 (included in the existing rules approved by Order of the Ministry of Agriculture of the Russian Federation № 267 from 05.23.2013)

Paragraph, subparagraph "Fishing Rules"	Edited version of the current Rules	Revision of the Rules, by order of the Ministry of Agriculture of the Russian Federation №385 from 10.21.2013	
<b>II. Fishing regulations for the industrial and (or) coastal fisheries in the inland sea waters of the Russian Federation, in the territorial sea of the Russian Federation on the continental shelf of the Russian Federation and in the exclusive economic zone of the Russian Federation as well as industrial fishing inland waters Russian Federation, excluding domestic sea waters of the Russian Federation (hereinafter referred to as inland water bodies)</b>			
A.13.7	to record the harvest and catch of <b>pink salmon, chum salmon, sockeye salmon, chinook salmon, coho salmon, and masou</b> (hereinafter - Pacific salmon) using any of the following methods: a) direct weighing of catches <b>on a special equipment for weighing catches of aquatic biological resources;</b>	9.7 to record the catch and delivery of Pacific salmon by any of the following methods: direct weighing of the catch;	instr resor
P.22 p.p. 22.16	22. When carrying out industrial and (or) coastal fishing, it is prohibited: 22.16. to harvest (catch) Pacific salmon on rivers located in the Kamchatka Territory (with the exception of the rivers of Bering Island from the group of the Komandorski Islands and the Ozernaya River, which flows into the Sea of Okhotsk, as well as in cases where fishing plots located on one water body, only one user has the right to harvest (catch) Pacific salmon at a distance of less than 1 km: a) between <b>fishing plots;</b> b) between <b>fishing plots and estuaries;</b>	31. When fishing is prohibited: 31.15. to harvest (catch) Pacific salmon at a distance of less than 1 km (with the exception of the fishing areas where they are caught according to the principle "one user per one water body", the rivers of Bering Island from the Commander group Islands and the Ozernaya River, which flows into the Sea of Okhotsk): between the <b>fish catching plots</b> ; between <b>fish catching</b> and estuaries;	
P. 32 p.p. 32.3	32. When catching aquatic biological resources, it is prohibited to: 32.3. use active fishing (catch) tools at a distance of less than one nautical mile from fixed seines, with the exception of: <b>beach seines</b> in the internal sea waters of the Russian Federation and the territorial sea of the Russian Federation adjacent to the Kamchatka Territory and the Magadan Region;	41. It is prohibited: b) to use: active fishing (catch) tools at a distance of less than one nautical mile from fixed seines <b>and line-meshing fishing gear</b> (except for beach seines);	fishi
Pp. 32.24	32.24. to harvest (catch) Pacific salmon by fixed nets in the fishing plots in the territorial sea of the Russian Federation adjacent to the territory of Kamchatka Krai and inland sea waters	18.22. to catch Pacific salmon with fixed nets in fishing areas located in the territorial sea of the Russian Federation and inland sea waters of the Russian Federation in the Petropavlovsk-Komandorsky subzone	



	of the Russian Federation in the Petropavlovsk-Komandorsky subzone (except for the water area of Avacha Bay and Kronotsky Bay), in the Karaginsky subzone, the West Bering Sea zone, the Kamchatka-Kuril subzone;	(except for the water area of Avacha Bay and Kronotsky Bay), in Karaginsky subzone, West Bering Sea zone, the Kamchatka-Kuril subzone (within the borders of the Kamchatka Territory), the <b>West Kamchatka subzone (within the borders of the Kamchatka Territory, south of 54 ° N)</b> ;	
<b>III. Fishing rules for recreational fishing of aquatic biological resources</b>			
P. 48, paragraph 3	48. .... Citizens are prohibited from <b>using nets in recreational fishing of aquatic biological resources in fish-farming sites,</b>	57. .... Citizens are prohibited from <b>catching aquaculture resources within the boundaries of fish-farming sites without the consent of fish-farming units</b>	fish-
P. 52.1 c)	52.1. recreational fishing: c) with the use of explosive, <b>chemical</b> , toxic and narcotic drugs (substances), weapons .....	61.1.3. with the use of explosive, toxic and narcotic drugs (substances), guns .....	
P. 52.5 b), c)	52.5. use: <b>b) nets</b> , without identifying their position with the help of identification buoys or signs, with the following information: the name of the user, the permit number for aquatic biological resources catch <b>c) tied nets</b> ;	61.7. use: ..... <b>nets</b> , without indicating their position using identification buoys or signs with the following information: the name of the user, the permit number for aquatic biological resources catch (as amended by Order of the Ministry of Agriculture of Russia dated 10.10.2015 No. 510) <b>tied nets</b> ;	
64.2 d)	64.2. permits: e) in water bodies located in the Kamchatka Territory, as well as in the internal sea waters of the Russian Federation and the territorial sea of the Russian Federation adjacent to their territories: <b>the catch of chinook salmon and coho salmon with the permit to catch aquatic biological resources with the help of fishing gear is allowed using not more than one fishing gear per one user</b> ;	This paragraph is missing.	
<b>VII. Fishing rules to ensure a traditional lifestyle and the implementation of traditional economic activities of indigenous peoples of the North, Siberia and the Far East of the Russian Federation</b>			

Sec. 88.2 b)	88.2. in case of catch without the use of vessels which are not subject to state registration, as well as small vessels, they must: a) put records in the fishing logbook; b) submit to the appropriate territorial authority of the Federal Agency for Fisheries information on the catch of aquatic biological resources: ..... in the case of catch <b>without permission to harvest (catch) aquatic biological resources:</b> annually, no later than January 20 of the year following the reporting year;	b) submit to the territorial bodies of the Federal Agency for Fisheries information on the catch of aquatic biological resources: ..... - in the case of catch <b>without providing a fishing plot:</b> - annually, no later than January 20 of the year following the reporting year.	
P.91 e) new	91. In traditional fishing, the use of all fishing gears is prohibited, with the exception of: ..... <b>f) line fishing gears;</b>	91. In traditional fishing, the use of all fishing gears is prohibited, with the exception of: Beach seines; nets overlapping no more than 2/3 of the width of the river bed, and the deepest part of the bed should remain free.	
P.93	93. When performing traditional fishing with the provision of fishing plots (except for fishing on the Amur River), one net is allowed <b>per one user - a member of the community of indigenous peoples of the North, Siberia and the Far East of the Russian Federation or an individual belonging to indigenous peoples of the North, Siberia and the Far East of the Russian Federation</b> , with a length of not more than 120 m and a height .....	for traditional fishing with the provision of a fishing plot (except for fishing on the Amur River) - one net is allowed no longer than 120 meters and a height .....	The
<b>IX. Responsibility for Fishing Rules violation</b>			
	absent.	<b>93. Users who harvest (catch) aquatic biological resources who are guilty of violating the Fishing Rules are held liable in accordance with the legislation of the Russian Federation.</b>	

Table 1.2 – Suggestions by Kamchatka Branch FGBNU "VNIRO" for making additional amendments in new fishing regulations for Far East fishery basin (approved by order of the Ministry of Agriculture from May 23, 2019 № 267)

Current edition	Proposed Edition	Justification for amendments	D
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**Section II. Fishing Rules in the implementation of industrial and (or) coastal fishing of aquatic biological resources**

<p>13. When carrying out industrial and (or) coastal fishing, users, with the exception of citizens, must:</p> <p>.....</p> <p>13.6. indicate:</p> <p>a) in places of catch of aquatic biological resources:</p> <p>records of fishing gears and fishing places (district, subarea, fishing zone, fishing subzone, coordinates, fishing plot) in the fishing logbook and other reporting documents;</p> <p>separate record of the catch per species and indicate weight (size) ratio of species in the fishing logbook and other reporting documents (with the exception of fishing, including catches at the places of delivery and unloading);</p> <p>b) at the places of delivery and unloading specified in clause 10 of the Fishing Rules, after the completion of each voyage, including catches at the places of delivery and unloading:</p> <p>separate record of the catch per species and indicate weight (size) ratio of species, total harvested (caught) for the entire period of the voyage, in the fishing logbook and other reporting documents;</p>	<p>13. When carrying out industrial and (or) coastal fishing, users, with the exception of citizens, must:</p> <p>.....</p> <p>13.6. indicate:</p> <p>a) in places of catch of aquatic biological resources:</p> <p>records of fishing gears and fishing places (district, subarea, fishing zone, fishing subzone, coordinates, fishing plot) in the fishing logbook and other reporting documents;</p> <p>separate record of the catch per species and indicate weight (size) ratio of species in the fishing logbook and other reporting documents (with the exception of fishing, including catches at the places of delivery and unloading);</p> <p><b>when harvesting (catching) anadromous fish species in fishing areas, it is allowed:</b></p> <p><b>total record of the catch without specifying the weight (size) ratio of species in the logbook and other reporting documents;</b></p> <p><b>subsequent corrections of the total catch weight calculated during unloading, with amendments in the logbook and other reporting documents no later than 12 hours 00 minutes following the days in which anadromous fish were caught;</b></p> <p><b>indication of the weight (size) ratio of species in the catch (without changing the total weight of the catch calculated at the places of unloading in the logbook and other reporting documents no later than 12 hours 00 minutes after the days in which anadromous fish were caught.</b></p> <p>b) at the places of delivery and unloading specified in clause 10 of the Fishing Rules, after the completion of each voyage, including catches at the places of delivery and unloading:</p> <p>separate record of the catch per species, an indication of the weight (size) ratio of species, total harvested (caught) for the entire period of the voyage, in the fishing logbook and other reporting documents;</p>	<p>In accordance with the recommendations of the Far Eastern Fishery Scientific Council held on February 21, 2020, it is proposed to amend the Fishing Rules in this paragraph proposed earlier by KamchatNIRO (decision No. 28 of KamchatNIRO dated 12.12.2019).</p> <p align="center"><b><u>Justification</u></b> <b>by</b></p> <p><b><u>KamchatNIRO:</u></b></p> <p>Based on a literal interpretation of the provisions of the Fishing Rules for the Far Eastern Fisheries Basin, approved by Order of the Ministry of Agriculture of Russia dated 05.23.2019 No. 267 (hereinafter referred to as the Fishing Rules), the catches of Pacific salmon should be assorted by species and recorded (with the records in the fishing logbook) in the places of their harvest (in the fishing plot).</p> <p>At the same time, the Fishing Rules require separate record of catches of Pacific salmon in one of the following ways: by direct weighing of the catch; volumetric weight method; unit-by-unit calculation followed by the calculation of average weight of the fish. If the calculation of total catch weight (without taking into account the factor of the loss of an enormous amount of time) is not particularly difficult, but to determine the species composition in a multi-species fishery requires a complete sorting of the catch.</p> <p>At the same time, such sorting is impossible without the use of special technological schemes, the use of a large number of personnel and the use of manual labor, requires the presence of a specially equipped area on the fishing site, the availability of</p>	<p><b>Extrac</b></p> <p><b>minu</b></p> <p><b>meetin</b></p> <p><b>“Kamc</b></p> <p><b>dated</b></p> <p><b>No. 29 -</b></p>
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tanks (stationary or mobile bins), equipment specially allocated for these purposes, etc. This is not to mention the problem with transportation of catches from sea fishing plot, which is actually impossible from the point of view of the current version of the Fishing Rules, when the exact weight and catch composition is also impossible to determine.

During the main run of anadromous fish, when catches are estimated in hundreds and thousands of tons per day, preliminary sorting of the catch in order to determine its species composition and weighing will lead at least to a significant underperformance of the allocated volumes, a loss in the quality of raw fish, and an increase in catch costs.

Moreover, the feasibility of preliminary determination of the exact weight and species composition of catches of anadromous species at catching places is highly controversial for the following reasons:

1) the existing procedure for organizing and conducting salmon fishing season and distribution of volumes is an "Olympic system" in which the concealment of catches (or the creation of "air" volumes of catch and products) is not economically justified;

2) the "Mercury" system, in which all operations (transactions) related to catching, transportation, processing, storage, transshipment, transfer of ownership, etc., are mandatory to record, it allows to track fishing activity online. It creates an insurmountable barrier for any kind of fraud with catches of anadromous species and products made from them;

		<p>3) the loss of raw material quality, fishery underperformance and increased costs of processing and production are inevitable.</p> <p>The list of main issues that need to be addressed in the proposed amendments to the Fishing Rules:</p> <p>1) In case of fishing anadromous species in the fishing plots, allow to indicate in the logbook and other reporting documents the total catch weight without specifying the weight (size) ratio of species in the catch, with the possibility of subsequent adjustment of the total weight of the catch calculated during unloading, with further changes in the logbook and other reporting documents no later than 12 hours 00 minutes of the day following the days in which anadromous species were caught. In this case, a deviation from the previously declared total weight of the catch of anadromous fish species within 10 percent in one direction or another is allowed. An error of 10% is established by clause 14.3 of the fishing rules for the Northern Fisheries Basin.</p> <p>2) Allow to indicate the weight (size) ratio of species in the catch (without changing the total catch weight calculated at the places of unloading) in the logbook and other reporting documents no later than 12 hours 00 minutes following the days in which the catch was carried out.</p>	
<p>22. When carrying out industrial and (or) coastal fishing, it is prohibited:</p> <p>.....</p> <p>22.4. keep records and provide information on the catch of aquatic biological resources with a distorted actual size of the catch, its species composition, used catching gears, terms, fishing methods, as well as without specifying the area of catch or indicating the wrong name of the area of catch, while it is allowed:</p>	<p>22. When carrying out industrial and (or) coastal fishing, it is prohibited:</p> <p>.....</p> <p>22.4. keep records and provide information on the catch of aquatic biological resources with a distorted actual size of the catch, its species composition, used catching gears, terms, fishing methods, as well as without specifying the area of catch or indicating the wrong name of the area of catch, while it is allowed:</p>	<p>In accordance with the recommendations of the Far Eastern Fishery Council, held on February 21, 2020, it is proposed to amend the Fishing Rules in this paragraph, previously proposed by KamchatNIRO (decision of the KamchatNIRO DC dated 12.12.2019 No. 29).</p>	<p>from the the me "Kam dated No. 29</p>

<p>.....  <b>Is absent</b></p>	<p>.....  <b>d) deviation from the previously declared total weight of the catch of anadromous fish species within 10 percent in one direction or another.</b></p>	<p>See the rationale for clause 13.6</p>	
<p>22. When carrying out industrial and (or) coastal fishing, it is prohibited:  .....  22.16. to harvest (catch) Pacific salmon on rivers located in the Kamchatka Territory (with the exception of the rivers of Bering Island from the group of the Komandorski Islands and the Ozernaya River, which flows into the Sea of Okhotsk, as well as in cases where fishing plots located on one water body, only one user has the right to harvest (catch) Pacific salmon at a distance of less than 1 km:  a) between <b>fishing plots</b>;  b) between <b>fishing plots</b> and estuaries;</p>	<p>22. When carrying out industrial and (or) coastal fishing, it is prohibited:  .....  22.16. to harvest (catch) Pacific salmon on rivers located in the Kamchatka Territory (with the exception of the rivers of Bering Island from the group of the Komandorski Islands and the Ozernaya River, which flows into the Sea of Okhotsk, as well as in cases where fishing plots located on one water body, only one user has the right to harvest (catch) Pacific salmon at a distance of less than 1 km:  a) between <b>places of setting fishing gears</b>  b) between the <b>places of setting fishing gears</b> and river mouths;</p>	<p>The current version of the Fishing Rules for the Far Eastern Fisheries Basin bans the harvest (catch) of Pacific salmon in the cases provided for in clause 22.16 of the Fishing Rules, according to which it is prohibited to harvest (catch) Pacific salmon in rivers located in the Kamchatka Territory salmon at a distance of less than 1 kilometer between fishing plots. At the same time, the earlier revision of the Fishing Rules prohibited fishing at a distance of less than 1 kilometer between fish catching plots. Fishing catching plot was a place on the fishing site, where fishing was actually carried out (where fishing gears were set).  With this regulation, a number of users lost this right. These are those users who were engaged in fishing in certain rivers of the peninsula, including the main fishing rivers, such as Kamchatka, Bolshaya and Vorovskaya, who obtained the right to use fishing plots in the manner established by law, the distance between which is less than 1 kilometers (most often located on opposite banks of the river) and engaged legally in fishing in these areas over the past ten years.  A classic example is the situation when two long industrial plots (a kilometer or more) and also an industrial plot + an amateur fishing plot, as well as an industrial plot + a traditional fishing plot are located closer than a kilometer apart, while fishing operations were implemented without the violation of Rules within the boundaries of</p>	<p>from th  the me  “Kam  dated  No. 29</p>

		<p>such plots at a distance of more than a kilometer from the actual fishing plots (places for setting fishing gear).</p> <p>The aforementioned users of aquatic biological resources annually caught fish within the limits established by fisheries science, showing high efficiency in the use of fishing plots, providing jobs primarily to the local population and citizens coming from other regions of the Russian Federation, supplying the domestic market with fresh and high-quality products, providing social assistance to the population and substantial assistance and support to regulatory and law enforcement agencies in the fight against poaching relevant water bodies.</p> <p>In order to protect the rights of users to engage in industrial fishing in the fishing plots provided for use in the established legal manner, we propose amendments to paragraph 22.16 of the Rules to allow users in the Kamchatka Territory to continue fishing in the fishing plots, replacing the restrictions related to the distance between fishing plots to restrictions related to the distance between the places of setting the fishing gears.</p> <p>Currently, the term “places for setting up fishing (catch) tools” is used in Order No. 170 of the Ministry of Agriculture of the Russian Federation dated 08.13.2013 “On Approving the Procedures for the Activities of the Commission on the Regulation of Anadromous Fish Species Catch”.</p>	
<p>32. When catching aquatic biological resources, it is prohibited to:</p> <p>.....</p> <p>32.24. to harvest (catch) Pacific salmon by fixed nets in fishing plots in the territorial sea</p>	<p>32. When catching aquatic biological resources, it is prohibited to:</p> <p>.....</p> <p>32.24. to harvest (catch) Pacific salmon by fixed nets in fishing plots in the territorial sea of</p>	<p>Clause 32.24 of the Fishing Rules in almost all fishing areas adjacent to the Kamchatka Peninsula, including in the Kamchatka-Kuril Subzone,</p>	<p>from the the me “Kam</p>

<p>of the Russian Federation adjacent to the territory of Kamchatka Krai and inland sea waters of the Russian Federation in the Petropavlovsk-Komandorsky subzone (except for the water area of Avacha Bay and Kronotsky Bay), in the Karaginsky subzone, the West Bering Sea zone, the Kamchatka-Kuril subzone;</p>	<p>the Russian Federation adjacent to the territory of Kamchatka Krai and inland sea waters of the Russian Federation in the Petropavlovsk-Komandorsky subzone (except for the water area of Avacha Bay and Kronotsky Bay), in the Karaginsky subzone, the West Bering Sea zone, the Kamchatka-Kuril subzone;</p> <p><b>b) in the territorial sea of the Russian Federation adjacent to the territory of the Sakhalin Region and the internal sea waters of the Russian Federation in the Kamchatka-Kuril subzone and the North Kuril zone;</b></p>	<p>prohibits the use of line-meshing gear when harvesting (catching) Pacific salmon.</p> <p>Also, in the Kamchatka Territory, strict measures are implemented to regulate catch in order to ensure the escapement of Pacific salmon spawners to spawning grounds, and their sustainable reproduction.</p> <p>Annually, according to the recommendations of fisheries science, the main fishing on the western coast of Kamchatka is allowed no earlier than the second half of July, the regime of passing days 2-3 days a week is introduced in all fishing plots, in some cases bans are established for industrial and other types of fishing.</p> <p>Mass spawning migrations of sockeye, chum, pink and pink salmon, which reproduce in the rivers of Western Kamchatka, happen through the coastal waters and straits of the Northern Kuril Islands.</p> <p>Since the mesh size of the nets is selected based on the biometric characteristics of the fish, other species with similar sizes are caught by the nets. Therefore, it becomes impossible to regulate the catch of Pacific salmon by selecting net parameters. Fish caught by the net will inevitably die.</p> <p>Thus, the use of line-meshing gear (fixed nets) set up at sea fishing plots in the Northern Kuril Islands leads to the situation when during the fishery all of the available salmon species are caught, including which are few in Western Kamchatka and need protection.</p> <p>In recent years, the possible catch of chinook salmon in Western Kamchatka has decreased 5.5 times - from 170</p>	<p>dated No. 29</p>
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tons in 2008 to today's 30 tons. Despite the fact that the total allowed catch of chinook salmon in the Kamchatka Territory has been allocated only for amateur fishing for several years already, and the state fish hatchery is working on its artificial reproduction in the Bolshaya river basin, the number of chinook salmon is steadily declining.

It is necessary to cease using fixed nets in the region of the Northern Kuril Islands, on the migration routes of Western Kamchatka chinook salmon to spawning sites.

Also, the issue of fishing by gillnets in the coastal waters and narrow straits of the Northern Kuril Islands has still not been addressed yet. In the indicated fishing area, there were several cases when unmarked nets ("lost fixed nets") were found without owners, which indicate the widespread practice of fishing outside the fishing plots with prohibited fishing gear and suggests the systematic violation of the Fishing Rules.

According to the information of the Border Directorate of the Federal Security Service of the Russian Federation for the eastern Arctic region, the recommendations on allowing officers of the Border Service of the FSB of Russia on fishing vessels in the Northern Kuril Islands, made during the meeting "On the preparations for the salmon catch season in 2019" by the Federation Council Committee on agricultural and food policy and nature management dated 05/22/2019 were left without results. The reason is that the users of aquatic biological resources refuse to take inspectors on their vessels.

		The current situation contradicts the protocol of the meeting with the Deputy Minister of Agriculture of the Russian Federation - Head of the Federal Fisheries Agency dated 01.29.2015 No. 44, which decided to replace driftnet fisheries with fixed seines (without anchoring to the shore) for 3 years and beach seines.	
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**Section III. Fishing rules for recreational fishing of aquatic biological resources**

48. Citizens have the right to carry out recreational fishing in public water bodies freely and free of charge in accordance with the Fishing Rules.  ..... <b>are absent</b>	48. Citizens have the right to carry out recreational fishing in public water bodies freely and free of charge in accordance with the Fishing Rules.  ..... <b>During recreational fishing with net fishing gear it is prohibited:</b> <b>To fish in water bodies, in water protection zone and coastal protective strips of water bodies with net fishing gear not registered in the territorial bodies of the Federal Fishery Agency and not having mandatory per-piece marking;</b> <b>To fish in water bodies, water protection zone and coastal protective strips of water bodies with net fishing gear during periods when their use is prohibited by fishing rules, as well as in places where their use is prohibited by fishing rules;</b> <b>To fish in water bodies, water protection zone and coastal protective strips of water bodies with net fishing gear, registered in the territorial bodies of the Federal Fishery Agency and having mandatory per-piece marking, outside fishing areas designated for recreational fishing, if their number exceeds the limit allowed for use by fishing rules;</b> <b>To fish in water bodies, water protection zone and coastal protective lanes of water bodies with gillnets that are registered in the territorial bodies of the Federal Fishery Agency and have mandatory per-piece marking outside areas designated for recreational fishing, without identification documents of the person who carried out the registration and labeling of these gill nets;</b> <b>To use gillnets without an identity document of the person who use them:</b>	In order to bring the Fishing Rules in line with the norms included in the Decree of the Government of the Russian Federation dated November 16, 2019 No. 1462 and dated November 21, 2019 No. 1482, taking into account the terms proposed by the Department for Control, Supervision and Fish Protection of the Russian Fisheries, it is proposed to amend paragraph 48 of Section III of the Fishing Rules (recreational fishing) on the introduction of provisions governing the use of net fishing (catch) tools.	Extra minu meet Pres Kamcha 1 dated ap
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	<p><b>To transfer gillnets by a person who has recorded and marked gill nets outside areas designated for the amateur fishing to other persons;</b></p> <p><b>To leave gill nets unsupervised;</b></p>		
<p>49....Citizens engaged in recreational fishing at fishing plots provided (allocated) for these purposes must have a permit and an identity document with them. At the end of a fishing operation (catch) by a citizen engaged in recreational fishing at fishing plots provided (allocated) for these purposes, information on the catch of aquatic biological resources shall be entered in the permit.</p>	<p>49. ...Citizens engaged in recreational fishing at fishing plots provided (allocated) for these purposes must have a permit and an identity document with them. At the end of a fishing operation (catch) by a citizen engaged in recreational fishing at fishing plots provided (allocated) for these purposes, information on the catch of aquatic biological resources, <b>the date of export (transportation) from the fishing plot</b> shall be entered in the permit <b>and shall be certified by the user of a fishing plot</b></p>	<p>This norm has been expanded to exclude the legalization of the export of Pacific salmon caught by poaching under the guise of recreational fishing, and will allow the prevention of uncontrolled fishing of Pacific salmon.</p>	<p><b>Extra</b> <b>minu</b> <b>mectin</b> <b>“Kam</b> <b>M</b> <b>dated</b> <b>ap</b></p>
<p>51. When organizing recreational fishing on the basis of a contract for the use of a fishing plot or an agreement on the provision (allocation) of a fishing plot, users (except citizens) must:</p> <p>a) issue permits to citizens within the limits of volumes or quotas allocated for the catch of aquatic biological resources;</p> <p>b) ensure separate record of the catch of aquatic biological resources by species, volume and areas (places) of catch of aquatic biological resources in the fishing logbook;</p>	<p>51. When organizing recreational fishing on the basis of a contract for the use of a fishing plot or an agreement on the provision (allocation) of a fishing plot, users (except citizens) must:</p> <p>a) issue permits to citizens within the limits of volumes or quotas allocated for the catch of aquatic biological resources;</p> <p>b) ensure separate record of the catch of aquatic biological resources by species, volume and areas (places) of catch of aquatic biological resources in the fishing logbook;</p> <p><b>and also certify the catch data in the issued permit in accordance with the terms, allowed quantities; this data is recorded in the permit and the fishing logbook, together with a daily catch summary;</b></p>	<p>This norm has been expanded to streamline the organization and implementation of recreational fishing in fishing areas assigned to users. This allows to evaluate TAC harvest rate and control over the issuance of permits, both by the user of the fishing site, and by citizens engaged in recreational fishing.</p>	<p><b>from th</b> <b>the me</b> <b>“Kam</b> <b>M</b> <b>dated</b> <b>a</b></p>
<p>52. Users of fishing plots allocated for the recreational fishing, as well as citizens are not entitled to:</p> <p>52.1. recreational fishing:</p> <p>e) by the method of chasing, gaffing and stunning;</p>	<p>52. Users of fishing plots allocated for the recreational fishing, as well as citizens are not entitled to:</p> <p>52.1. recreational fishing:</p> <p>e) by the method of chasing, gaffing (including hooking) and stunning;</p>	<p>It is proposed to expand subparagraph e) to include, as in the previous fishing rules, the clarification of one of the types of gaffing - a hooking method that has become actively used under the guise of amateur fishing for the catch of Pacific salmon, after this clarifying concept had been excluded from the new Fishing Rules. This method causes numerous damage to Pacific salmon that spawn, and its use is not at all connected with recreational fishing in order to satisfy personal needs, under the guise of which commercial</p>	<p><b>from th</b> <b>the me</b> <b>Kamch</b> <b>dated</b> <b>201</b> <b>a</b></p>

		fishing of Pacific salmon and roe production is carried out.	
<p>62. In recreational fishing it is prohibited:  .....  <b>is absent</b></p>	<p>62. In recreational fishing it is prohibited:  .....  <b>j) the use of fixed nets , floating nets and beach seines in inland water bodies of the Kamchatka Territory in fishing plots with a length of more than 1,500 meters, with the exception of fishing plots within the borders in accordance with Appendix No. 11.</b></p>	<p>In accordance with the requirements of Art. 65 of the Federal Law of December 20, 2004 No. 166-Ф3 “On Fisheries and the Conservation of Aquatic Biological Resources”, agreements on the provision of a fishing plot for amateur and sport fishing are subject to renewal by January 1, 2020. They are to be changed to the agreement on the use of the fishing plots for the rest of the term of the previously concluded agreement on the provision of a fishing plot.</p> <p>The List of fishing plots in the Kamchatka Territory previously provided restrictions on fishing gear used in fishing plots.</p> <p>Out of 82 fixed fishing plots in inland water bodies, the use of nets and beach seines was allowed in 22 plots, it was forbidden in 60 plots (created at the request of tourism companies in the region, often of considerable length (there are sections over 100 km long in the region) and, as a rule, far from settlements). In turn, most of the “net” sites in the Kamchatka Territory are up to 1,500 m long, located near settlements and have important social significance, as they are intended for citizens to access the organized Pacific salmon fishing for personal consumption.</p> <p>Since the form of the concluded agreement on the use of the fishing plot does not contain obligations regarding the use of fishing gear in the fishing plots, from 2020 it will be possible to use all fishing gear permitted by the Fishing Rules (including fixed nets, floating nets and beach seines) at any fishing</p>	<p>the mi  mee  Pres  Kamcha  12.12.2  to a</p>

		<p>plot, intended for recreational fishing, including those previously intended exclusively for line-fishing. The implementation of amateur fishing by fixed and floating nets, as well as by beach seines in additional 60 sites of considerable length will significantly increase the fishing pressure on Pacific salmon stocks, will cause difficulties in conducting fish conservation measures, and, due to the remoteness of the sites from settlements, it will not carry a social burden providing the population with aquatic biological resources.</p> <p>To correct the situation, it is proposed to prohibit the use of fixed and floating nets in the inland water bodies in the Kamchatka Territory, as well as beach seines in fishing plots with a length (length) of more than 1.5 km, with the exception of socially significant fishing plots No. 689 (Vorovskaya river , the channels of Lyubkin and Feshkin), 694 (Udova River), 838 (Kamchatka River), 849 (Kamchatka River), 1049 (Apuka River), where net fishing was permitted earlier by the agreement on the use of the fishing plot and the length of which is more than 1500 m. Description of the boundaries of fishing plots, where it is allowed to use gill nets, floating nets and beach seines are suggested to include in Appendix 11 to the Rules for fishing Far East fishery basin.</p>	
<p>64.2. with permits: e) in water bodies located on the territory of the Kamchatka Territory, as well as in the internal sea waters of the Russian Federation and the territorial sea of the Russian Federation adjacent to their territories:</p>	<p>64.2. with permits: e) in water bodies located on the territory of the Kamchatka Territory, as well as in the internal sea waters of the Russian Federation and the territorial sea of the Russian Federation adjacent to their territories: in the catch of chinook salmon and coho salmon with the help of line fishing gear - not</p>	<p>This norm was expanded after the law enforcement practice of the current Fishing Rules, which entered into force in 2019, had been analyzed. It showed that under the guise of hook-and-line fishing of Pacific salmon species, the most valuable ones are</p>	<p><b>Extra</b> <b>min</b> <b>m</b> <b>Kam</b> <b>dated 0</b> <b>23.-</b></p>

in the catch of chinook salmon and coho salmon with the help of line fishing gear - not more than one line fishing gear per one citizen;

more than one line fishing gear per one citizen; **with one lure or wobbler or other artificial bait without flavorings and natural bait (bait)** per one citizen;

caught: chinook salmon and coho salmon, for which the number of fishing gears is limited to one, an unlimited number of line fishing gears for all others. Thus, when a citizen conducts fishing (catching) simultaneously using several fishing (catch) tools, while claiming that he uses one fishing (catch) tool for chinook salmon or coho salmon, and others, for example, for masou, etc. ., it allows to evade responsibility in case of non-compliance with paragraph 64.2. d) (second paragraph).

Also, in order to enhance the intensity of fishing, aromatic and natural baits are used, which give almost one hundred percent result when using a large number of line-fishing gear.

Thus, these restrictions will allow avoiding commercial catch of chinook salmon and coho salmon under the guise of amateur fishing.

72. The daily catch rate of aquatic biological resources (unless the permanent or temporary prohibition of harvest (catch) is established for such aquatic biological resources in recreational fishing) for one citizen in recreational fishing within the borders of the Kamchatka Territory, as well as inland sea waters and territorial sea are indicated in table 6:

Table 6

Types of aquatic biological resources	Daily catch rate (inland sea waters of the Russian Federation, territorial sea of the Russian Federation), units	Daily catch rate of (inland water bodies), units

72. The daily catch rate of aquatic biological resources (unless the permanent or temporary prohibition of harvest (catch) is established for such aquatic biological resources in recreational fishing) for one citizen in recreational fishing within the borders of the Kamchatka Territory, as well as inland sea waters and territorial sea are indicated in table 6:

Table 6

Types of aquatic biological resources	Daily catch rate (inland sea waters of the Russian Federation, territorial sea of the Russian Federation), units	Daily catch rate of (inland water bodies), units

In accordance with the recommendations of the Far Eastern Far East Scientific and Industrial Council held on February 21, 2020, it is proposed to revise the daily catch rate of Pacific salmon proposed earlier by KamchatNIRO (decision of the KamchatNIRO CA dated August 22, 2019 No. 23).

It is proposed to establish this norm in order to ensure control and supervision of recreational fishing of Pacific salmon and smelt. In order to avoid situations when a citizen harvests (catches) simultaneously on several permits using several fishing (catch) tools, which allows, under the guise of amateur fishing, to harvest (catch) Pacific salmon and smelt at the industrial fishing level, it is proposed to establish a daily catch rate of Pacific salmon

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Smelt in the Petropavlovsk-Komandorskiy <b>Subzone</b>	-	200	Smelt in the Petropavlovsk-Komandorskiy and <b>Karaginskiy Subzones</b>	-	200	<p>when implementing recreational fishing per one citizen in the national inland water bodies within the boundaries Kamchatsky Kray and in its inner sea waters and territorial sea, as well as smelt in Karaginskaya subzone.</p> <p>Based on the real status of the regional Pacific salmon stocks, as well as the available data on the recommended annual per capita consumption of fish products, we propose to determine the following daily catch rates of Pacific salmon in the sea and inland waters of the Kamchatka Territory: pink salmon - 20 fishes, chum salmon - 5 fishes, sockeye salmon - 5 fishes, coho salmon - 3 fishes, chinook salmon - 1 fish, masou - 3 fishes. Given this quantitative distribution of salmon species, their total maximum daily catch may be 37 fishes. This level of amateur catch will provide the population with fish products for the winter and fall period.</p> <p>In the near future, the anthropogenic impact on the stock of Asian smelt in the Karaginsky subzone will only increase, as the number of this species in water bodies of the Petropavlovsk-Komandorskiy subzone decreases. Therefore, we propose to introduce daily catch rates for this species within the Karaginsky subzone at the level of 200 fishes for 1 person. This norm is fully consistent with a similar restriction for the Petropavlovsk-Komandorskiy subzone.</p>	
			<b>Chinook salmon</b>	<b>1</b>	<b>1</b>		
			<b>Red salmon</b>	<b>5</b>	<b>5</b>		
			<b>Chum</b>	<b>5</b>	<b>5</b>		
			<b>Coho salmon</b>	<b>3</b>	<b>3</b>		
			<b>Sima</b>	<b>3</b>	<b>3</b>		
			<b>Pink salmon</b>	<b>20</b>	<b>20</b>		
<b>Is absent</b>			<b>Appendix No. 11 to the Fishing Rules for the Far Eastern fishery basin</b>  <b>FISHING PLOTS IN DOMESTIC WATER BASINS IN KAMCHATKA KRAI, IN THE BOUNDARIES OF WHICH FIXED</b>	See the rationale for subparagraph "k" of paragraph 62.			from the the me  "Kam dated No. 29

**NETS, FLOATING NETS AND BEACH  
SEINES ARE PERMITTED**

**Sobolevsky municipal district:**

**1. The Vorovskaya river, the channels of Lyubkin and Feshkin. The boundaries of the plot: the lower border is the confluence of the Lubkin and Feshkin channels with the main channel of the Vorovskaya river, the upper border - along the Lubkin channel - 2500 m, along the Feshkin channel - 3000 m, both banks. The length of the plot - 5500 meters;**

**2. The river Udova. The boundaries of the plot: the lower boundary is the mouth of the Udova River, the upper boundary is 500 m downstream from the stationary bridge to the Ustievoe settlement, both banks. The length of the plot is 3500 meters.**

**Ust-Kamchatsky municipal district:**

**1. The Kamchatka River. The boundaries of the plot: the lower boundary is the mouth of the Lugovitsa canal, the upper boundary is 6000 m upstream from the mouth of the Lugovitsa channel, both banks. The length of the plot is 6000 meters;**

**2. The Kamchatka River, the fishing plot "Ulovo Kolkhoznoe". The boundaries of the plot: the lower boundary is the western end of the village of Kozyrevsk, the upper boundary is 2000 m upstream from the western end of the village of Kozyrevsk, both banks. The length of the plot is 2000 meters;**

**Olyutorsky municipal district:**

**Apuka River. The boundaries of the site: the lower boundary is 6000 m upstream from the mouth of the Apuka River, the upper boundary is 8000 m upstream from the mouth of the Apuka River, both banks. The length of the plot is 2000 meters.**



## Chapter 2. Pacific salmon target escapement goals to evaluate the efficiency of fishery management in the region

The target reference points for optimal escapement level of Pacific salmon in the Kamchatka Territory are determined by mathematical modeling of the regularities found in stable returns of spawners provided there is the sustainable fishing (Feldman et al., 2018, 2019). The time period of observations is long enough to calculate the variability of fluctuations in the salmon stock under the increased fishing pressure - 1990–2016 .

Within the Kamchatka Territory, the number of escaped salmon spawners to spawn in the majority of water bodies is counted mainly using aerovisual surveys on helicopters. The high cost of helicopters determines the selective nature of aerovisual surveys. In this regard, experts from KamchatNIRO have developed a method of aerovisual surveys for target water reservoirs, whose spawning stock is key factor in the formation of regional stocks of Pacific salmon herds (Sevlakovs, Maslov, 2011). Accordingly, many water bodies fall out from observations. Therefore, salmon stocks are mainly estimated as general (aggregated) for a separate administrative fisheries subzone or for a specific coast of the peninsula.

In this report a similar stock assessment method is used for pink salmon, chum salmon and coho salmon, as well as sockeye salmon of minor herds on the southwestern coast of Kamchatka. In this case, we are talking about Opala and Golygina rivers. The exception is the stock of sockeye salmon in the r. Ozernaya (lake Kurilskoe, wherein escapement level is evaluated using fish counting gear (RUZ) and sonar system « BioSonics » . RUZ is located at the source of the river. Ozernaya in close proximity to the KamchatNIRO stationary observation post. Hydroacoustic sonar is installed annually in the middle courses of the river Ozernaya. Both methods complement each other in order to maximize the accuracy in counting spawners escaped to the Kuril Lake.

Thus, for the indicated water bodies (except for Ozernaya River), the escapement target goals are determined based on the ratio between the average long-term escapements and the total escapement level for the aggregated stock in the western coast of Kamchatka. In accordance with the precautionary approach paradigm and Pacific salmon reproduction characteristics, reference points for stock management are divided into three classes:  $S_{buf}$  — buffer,  $S_{msy}$  — escapement at the maximum sustainable catch,  $S_{max}$  — precautionary assessment

of  $S_{msy}$ . The target escapement range should preferably be between  $S_{buf}$  and  $S_{max}$  and in the long-term average, correspond to  $S_{msy}$ .

**Pink salmon**

The reference points for escapement of pink salmon in the studied rivers of Western Kamchatka are presented in Table 2.1. Dynamics of the aggregated number of spawners in 2005–2019, relative to specific target reference points shown in Figure 2.1. Similar graphs for each studied water body are presented in Figure 2.2.

Table 2.1 – Reference points for pink salmon fishery management in the studied rivers of Western Kamchatka, thousand spawners

Water	Buffer ( $S_{buf}$ )	Target ( $S_{msy}$ )	Maximum ( $S_{max}$ )
The total in West Kamchatka	9000	17000	31000
Cluster rivers Opala- Golygina	1111	2177	4005
R. Ozernaya	210	411	756

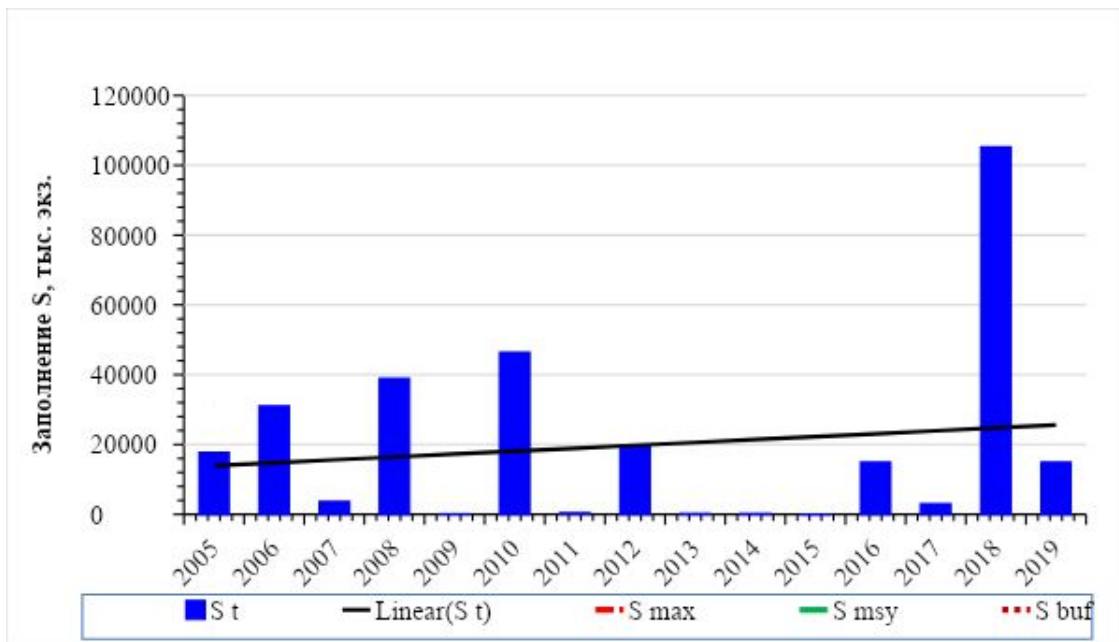


Figure 2.1 - Dynamics of aggregated escapements of pink salmon in the spawning grounds of the Western Kamchatka against target reference points over the past 15 years

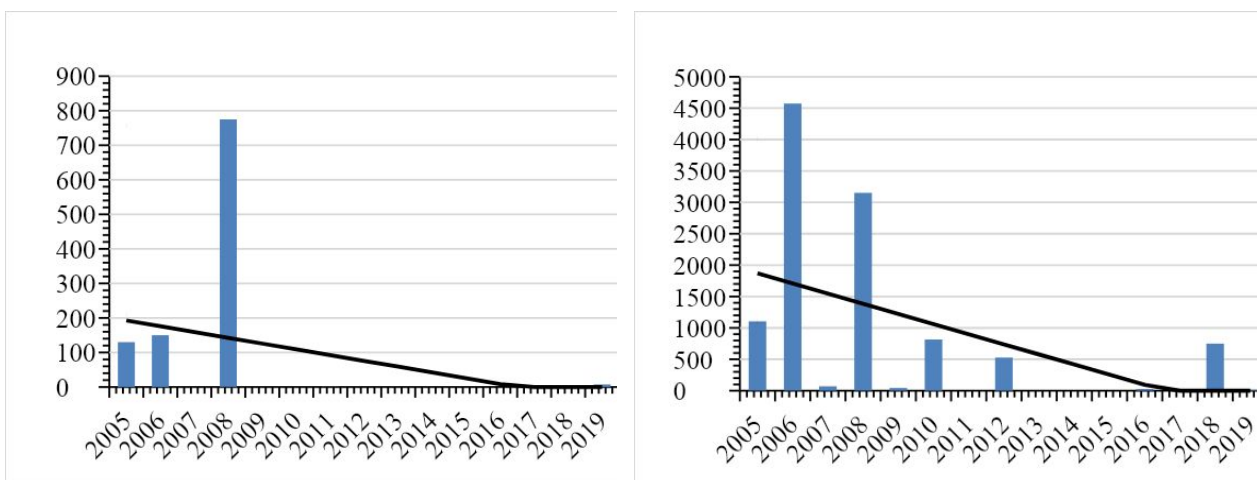


Figure 2.2 - Dynamics of pink salmon escapements in the spawning grounds of studied rivers of the Western Kamchatka against target reference points over the past 15 years, thousands of spawners

We should note that the West Kamchatka region is characterized by a numerical predominance of the even-year reproduction lines. Until the 2010s based on economic feasibility, aerovisual counting surveys were carried out mainly in even years, and in odd years they were carried out only to count chum or sockeye salmon.

A sufficient amount of counting for the odd reproduction line was carried out only in the last two cycles of 2017 and 2019. At the same time, this line in the period 2007–2017 was in the depressed state, and only in the last reproduction cycle it reached the target escapement level. It should be noted that pink salmon escapement is not sufficiently estimated both in odd and even years in the rivers south of the river Bolshaya (Opala and Golygin rivers), and even farther south (Koshechek and Ozernaya rivers) the counts were often not carried out at all .

### ***Chum***

Reference points for target escapement of chum salmon in the spawning grounds of the Western Kamchatka are shown in Table 2.2. Dynamics of the aggregated number of spanwers in 2005–2019 relative to specific target values in the Kamchatka-Kuril subzones are shown in Figure 2.3. Similar graphs for each studied water body are presented in Figure 2.4.

Table 2.2 – Reference points for chum salmon fishery management in the studied rivers of Western Kamchatka, thousand spawners

Water	Buffer ( $S_{buf}$ )	Target ( $S_{msy}$ )	Maximum ( $S_{max}$ )
<i>Total in the Kamchatka-Kuril subzone</i>	172	300	373
Cluster rivers Opala- Golygina	43.5	76	94
R. Ozernaya	5.1	8.8	11

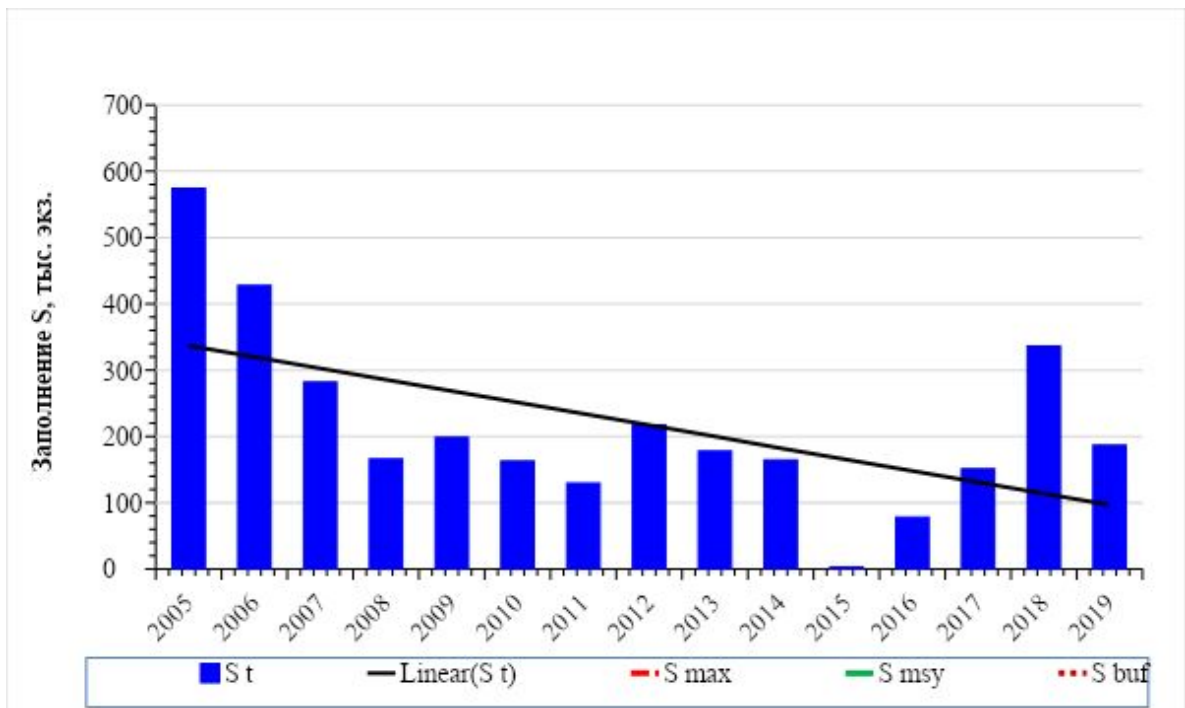


Figure 2.3 - Dynamics of aggregated chum salmon escapements in the spawning grounds of Kamchatka-Kuril subzone against target reference points over the past 15 years

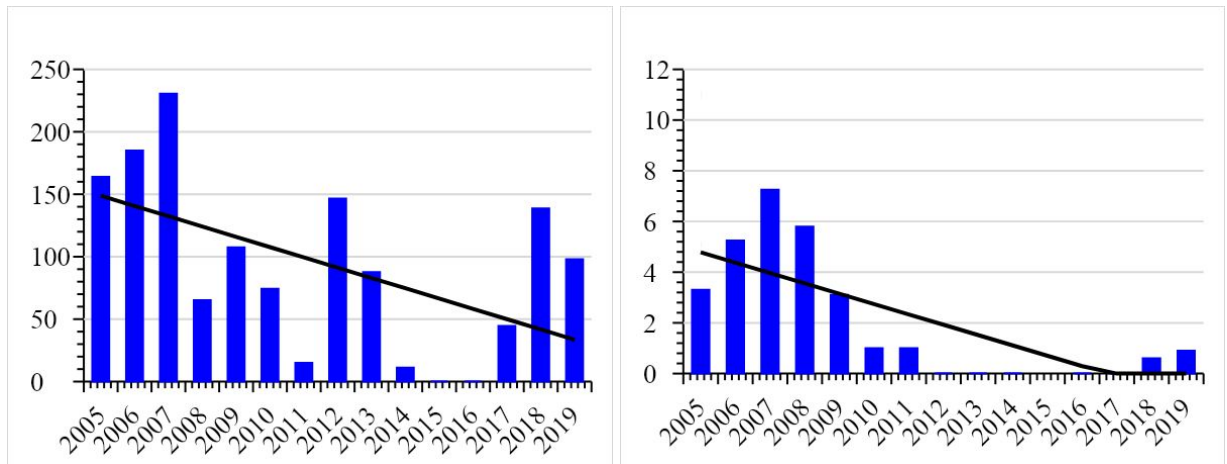


Figure 2.4 - Dynamics of aggregated chum salmon escapements in the spawning grounds of West Kamchatka against target reference points over the past 15 years

It should be noted that the level of regional escapements of the West Kamchatka chum spawners has decreased in recent years. In this case, there is a tendency of sufficient escapement in even years, and on the contrary, insufficient – in odd years. Most likely, this is due to a decrease in industrial pressure on this species during the years of abundant runs of pink salmon of even-year line .

By analogy with the pink salmon, aerovisual surveys to assess the escapement level of chum salmon in rivers Koshegochek and Ozernaya were not conducted almost over the past 10 years. However, we should note that chum salmon escapement decrease in recent years is an objective trend. When analyzing the dynamics of chum salmon escapement in each rivers, it is clear that a relatively high level of escapement is characteristic for cluster rivers Opala-Golygina.

### ***Sockeye salmon***

Data on escaped sockeye salmon in the r. Ozernaya are one of the most reliable, because its total escapement level is assessed annually. This stock is at a consistently high level of abundance (Fig. 2.6). Reference points for sockeye salmon fishery management are shown in Table 2.3.

Table 2.3 - Management reference points for Ozernaya sockeye salmon fishery, million spawners

Waterbody	Buffer ( $S_{buf}$ )	Target ( $S_{msy}$ )	Maximum ( $S_{max}$ )

R. Ozernaya	0.75	1.14	1.9
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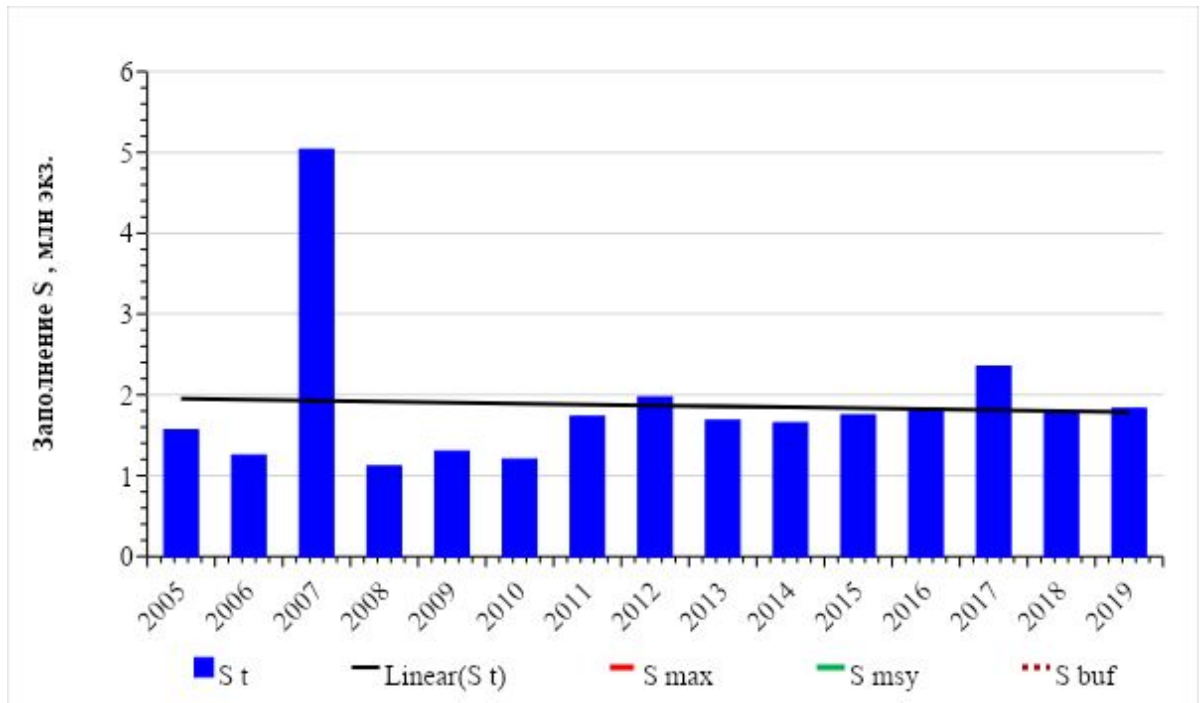


Figure 2. 6 - Dynamics of sockeye salmon escapement level in spawning grounds of the Kuril lake against the target reference points for the past 15 years

### Chapter 3. Provide data on escapement of Pacific salmon for MSC certified rivers in 2019

#### *Pink salmon*

In 2019, the escapement of pink salmon to the rivers of Western Kamchatka exceeded 20 million spawners. The analysis of the distribution of catches and the escapement level in spawning grounds along the coast shows that the most abundant runs of pink salmon to the coast were observed on a site from the river Kolpakova to the river Kihchik. To the south and north of the specified zone, within the boundaries of the river Bolshaya to the river Icha, the intensity of the runs markedly decreased. South of the river Bolshaya the number of pink salmon in the rivers did not exceed 0.54 million fish (Fig. 3.1).

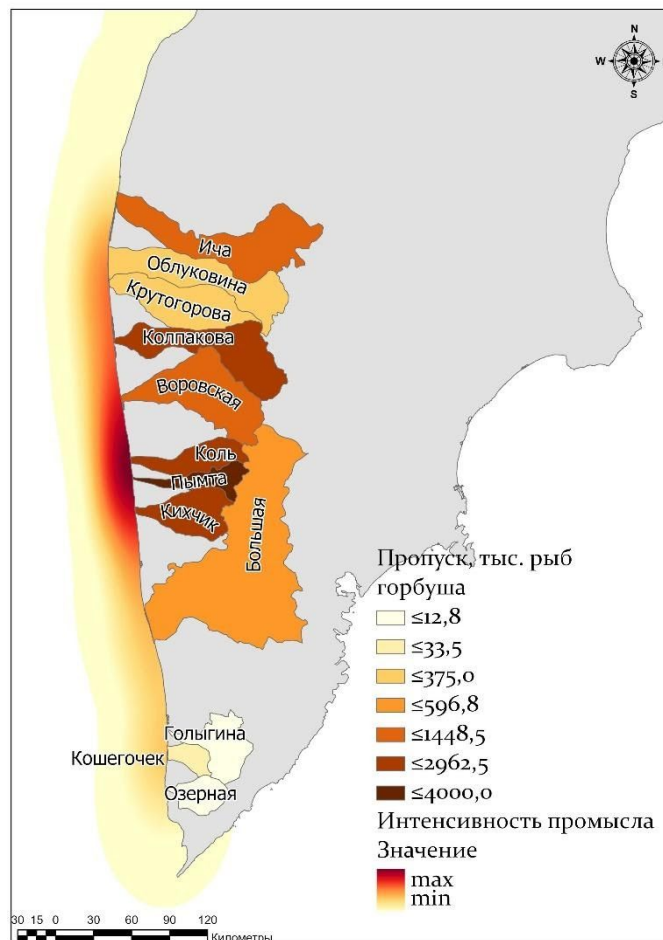


Figure 3.1 - Distribution of pink salmon spawners in the rivers of the western coast of Kamchatka and the intensity of pink salmon fishing in 2019.

In Opala and Ozernaya rivers (included in the certification unit for Delta fishery), the total number of pink salmon was 12.8 and 7.5 thousand fish, respectively. The number of salmon in Opala river should be assessed in the system of Opala and Golygin rivers together. These rivers have a common channel, therefore, the spawning salmon stock should be considered as a single stock. Based on this, the target escapement goals were calculated, representing a stratified model, where the value of the lower stratum corresponds to the escapement level of the depressed generations, and the upper stratum corresponds to the escapement level of highly productive generations. For Opala – Golygina river system, the optimal escapement values are calculated in the range from 528 to 2474 thousand fish. Obviously, the escapement of 12.8 thousand fish does not meet the escapement level required for implementing the strategy for maximum sustainable yield (MSY).

For Ozernaya river target reference points for the escapement of pink salmon are defined in the range from 111 to 519 thousand fish. The registered escapement level of pink salmon spawners in the river. Ozernaya amounted to 7.5 thousand fish, which also does not meet the necessary optimum values.

We should note that in recent years there has been a decrease in the runs to river mouths located south of the river Bolshaya, and this trend is characteristic of both generative lines. Even in the year of maximum abundance (2018), when the escapement level on the coast exceeded 105 million fish, the run of pink salmon spawners into the Opala – Golygina river cluster slightly exceeded the optimum calculated for depressed generations of pink salmon, and in Ozernaya river the number of pink salmon did not exceed 3 thousand spawners. Pink salmon run in 2019 was not an exception, which is proved by fishing statistics and escapement level (Fig. 3.1.)

### ***Chum***

On the western coast of Kamchatka aerovisual monitoring of spawning rivers took place in three stages. Given the relatively long period of spawning migration of chum salmon, the main task was to assess the number of fish throughout the spawning run with a time interval that precludes the second counting of spawners in spawning grounds. Thus, in the period from August to September, three flights were conducted with an interval of more than 20 days, assuming that the change of chum generations in the spawning grounds occurs in a period of not more than 20 days.



The survey results showed that chum salmon in the rivers of the west coast was amounted for 520 thousand spawners. Regarding the target reference point of 638 thousand spawners, the spawning is estimated at the level of suboptimal values. With the resulting ratio, the escapement level is 82%.

98.9 thousand spawners were counted in the target rivers, which is lower than the target reference point calculated in the range from 85 thousand to 105 thousand spawners. The majority of counted spawners were chum salmon from Opala-Golygina rivers (98 thousand spawners), and specifically in Opala (92,5 thousand).

Spawning stock of chum salmon in the Ozernaya river amounted to 0.9 thousand fish, which is significantly lower than the required optimum, determined in the range from 8.8 to 11 thousand fish. According to counting statistics, the average long-term escapement level for Ozernaya river are 5.5 thousand fish, but in some years, escapement level exceeded 10 thousand fish. As can be seen from the graph (Fig. 3.3), the spawning stock of chum salmon does not exceed the value of the lower stratum of the target escapement level from 2003. It is possible that the stock decrease is caused by the ongoing population processes, which was also observed in earlier years.

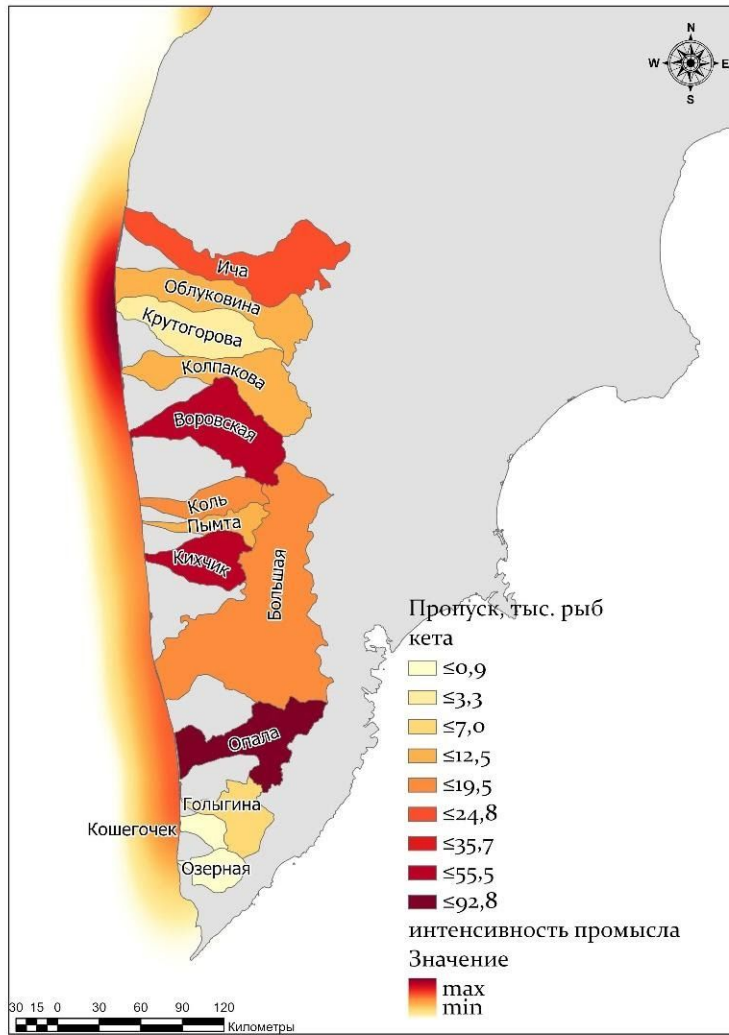


Figure 3.2 - Distribution of chum salmon spawners in the rivers of the western coast of Kamchatka and the intensity of chum salmon fishery in 2019.

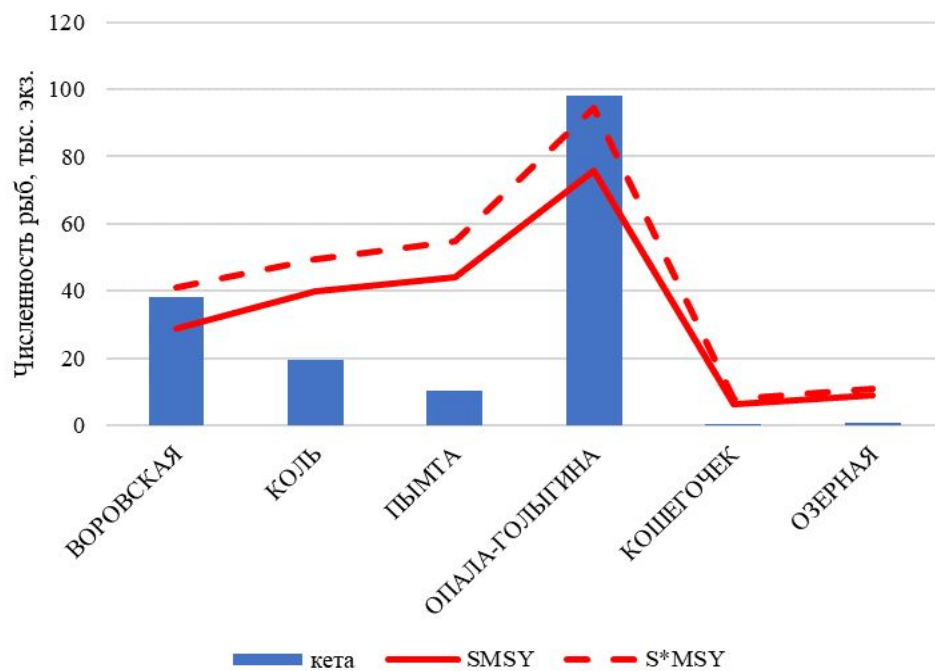


Figure 3.3 – Escapement level of chum salmon spawners in the target rivers in 2019 and target reference points calculated for them

### ***Sockeye salmon***

Aerovisual surveys of sockeye salmon in target rivers (with the exception of the Ozernaya River) was carried out in an reduced format. The recorded number of sockeye was registered in third decade of August that time corresponds to the initial phase of spawning. The number of counted spawners amounted to: Opala - Golygina (51.65 thousand fish). It should be noted that severe weather conditions in the first half of September impeded the implementation of planned aerovisual surveys during the mass spawning of sockeye salmon. The next survey of spawning grounds took place at the end of September; during this period, sockeye salmon spawners were not seen. The obtained data showed that the optimum escapement level in the spawning grounds was met only in Opala - Golygin river cluster, where the target was calculated in the range from 31.2 thousand to 67.3 thousand fish.

The counted number of sockeye salmon in the basin of the river Ozernaya is estimated at 1,830 thousand fish. Data on Ozernaya sockeye salmon escapement is described in more detail in Chapter 4.

## **Chapter 4. Update Appendix A (Table ‘Red salmon spawning in Ozernaya river in 2019’)**

The total number of sockeye salmon spawning runs in 2019 in Ozernaya river amounted to 12,836 million spawners (Table 4.1). According to the Northeastern Federal Fisheries Agency (hereinafter referred to as SVTU), 26,337 tons (10.616 million fish) of sockeye salmon were caught by fixed nets in Ozernaya river. 1.830 million spawners escaped to spawn in the Kuril lake (Ozernaya River), which exceeds the optimum by 30 thousand spawners. In the sea near the Northern Kuril Islands in 2019, 1336 tons of sockeye salmon were caught. It is believed that the annual catch of sockeye salmon reproducing in the northern Kuril Islands is 200 tons. Therefore, the rest of the sockeye salmon was transit and belonged to herds from rivers on the western coast of

Kamchatka. The total catch of sockeye salmon at the western coast of Kamchatka in 2019 was 30.943 thousand tons, 26.338 thousand tons of which belonged to the herd of the river Ozernaya. Thus, 0.967 thousand tons of sockeye salmon from Ozernaya river were caught near the Northern Kuril Islands, or with an average weight of sockeye salmon of 2.48 kg from this herd in industrial catches in 2019 - 390 thousand fish. Thus, the total catch of sockeye salmon from Ozernaya river in 2019 amounted to 11.006 (10.616 + 0.390) million fish.

Table 4.1. Data on reproduction of sockeye salmon herd in Ozernaya river in 2019, million spawners

Year	Spawning	Sea catch	Coastal catch	Total catch
2019	1,830	-	11,006	11,006

Until recently, a significant number of Pacific salmon, including sockeye salmon, were caught by drift nets in the open sea. However, on June 29, 2015, Federal Law No. 208-ФЗ “ On Amending the Federal Law “ On Fisheries and the Conservation of Aquatic Biological Resources ” was issued. This law prohibited the use of drift nets in the industrial fishing and fishing for scientific research and monitoring purposes, and coastal fishing for anadromous fish species in the inland waters of the Russian Federation, in the territorial sea of the Russian Federation and in the exclusive economic Russian zone. The law entered into force on January 1, 2016. Accordingly, the sockeye salmon was not harvested in the seas in the EEZ of the Russian Federation in 2019.

## **Chapter 5. Annual report on fishery management actions taken by Anadromous Fish Commission in 2019**

Recommendations for the salmon fishing season in 2019 were based on scientific materials, analysis of the dynamics and results of previous fishing season. The main fisheries in the western coast of Kamchatka are pink salmon of even year reproduction line, late chum salmon and sockeye salmon and, in recent years, coho salmon. The main stocks of pink salmon, chum salmon and coho salmon are concentrated in the Sobolevsky and Ust-Bolsheretsky districts in relatively close water bodies, which allows them to be considered as a single stock for each species, for which similar fishing control measures are applied.

In general, it can be noted that West Kamchatka salmon stocks are relatively high for all mass species. However, despite the regional stability of stocks, in some water bodies there is a tendency in salmon stock decrease of some species, which requires fishing regulation, both in river and marine fishing plots.

*Fishing regulation measures.* Since the reproduction of salmon is limited by the area of spawning grounds, the rational salmon fishing is to ensure sufficient number of escaped spawners in the spawning grounds, and the harvest of the rest number of spawners. However, the spawners cannot escape and fill the spawning grounds at once in one of the phases of run, but should escape to the spawning grounds during the run, providing access to spawning grounds for all epigenetic groups of spawners. As salmon moves to spawning grounds, they overcome sea coastal spaces, estuaries of the river, and only then reach spawning habitats. Thus, the restrictions on fishing should first be made for sea coastal waters, and then in the river fishing plots. One of the ways to do so is to set passing days for salmon spawners.

Relatively high runs of pink salmon were expected in the salmon fishing season of 2019 in the western coast of Kamchatka, despite the fact that the return was ensured by the spawners of the low-harvest (odd year) reproduction line. Accordingly, the fishery management and regulation was carried out taking into account this forecast. The forecast of the stock status of other mass species of Pacific salmon (late sockeye salmon and chum salmon) potentially indicated that their abundance was close to the long-term average.

It should be noted that the main stocks of sockeye salmon are concentrated locally in the coastal areas adjacent to the Ozernaya and Palana rivers, as well as in the river basins themselves, and must be separately regulated. River sockeye salmon and chum salmon are caught together with pink salmon. Long-term practice shows that with high runs of pink salmon, species caught together are under much less fishing pressure than during low-harvest years. This is explained by redistribution of the fishing load between species.

The use of special regulatory measures is recommended for Ozernaya river fishing plots and sea fishing plots (№№ 189-209), located on the migration routes of sockeye salmon to the river.

The recommended 2019 Pacific salmon and char fishing regime in Kamchatka fishing plots was as follows.

Fishing season started:

- in the basin of river Ozernaya from June 20, in the adjacent sea from fishing plot # 189 (inclusive) to the south to fishing plot # 209 from July 21;

- in other river and sea fishing plots of the Ust-Bolsheretsky region from July 11 .

At the same time, for all types of fishing (with the exception of sport and recreational fishing using line-fishing gear, fishing for scientific research and reproduction purposes), the following passing day regime was recommended:

- sea fishing plot in the West Kamchatka sub-zone from the beginning of the fishing season until July 25 and from August 26 until the end of fishing - Monday, Tuesday, Wednesday each week.

- sea fishing plot in the Kamchatka-Kurile subzone, except the waters of the fishing plots # 189 (inclusive) in the south to the fishing plot # 209 (inclusive) in the period from the beginning of the fishing until July 25 and from August 26 until the end of fishing - Monday, Tuesday weekly.

At inland water bodies:

- in the rivers and lakes of Western Kamchatka, with the exception of the Bolshaya and Ozernaya (western) river basins, from the start of fishing until July 25 and from August 26 to the end of fishing - Monday, Tuesday, Wednesday weekly, from July 26 to August 25 - Monday, Tuesday weekly;

- in the basin of Ozernaya river (western) passing days were set in the regime of two passing days after two days of fishing.

#### *Fisheries regulatory measures taking into account the actual salmon runs in 2019*

In relation to fishing plots in the basin of Ozernaya river and adjacent water areas the fishing regulation was targeted at maintaining stocks of sockeye salmon. Sockeye salmon escapement in the Kuril lake as of July 29, 2019, according to the fish counting gear (RUZ), amounted to more than 986 thousand spawners. In this connection, according to the Minutes No. 16 of the Commission for catch of anadromous fish species in the Kamchatka Territory dated July 29, 2019 and No. 19 dated August 6, 2019, the passing days on July 29 (from 2 p.m.) were canceled , 01, August 02, 05, 06, 09 and 10.

When the escapement of sockeye salmon in the Kuril Lake reached the lower limit of the optimum, the previously established regime of passing days on the river fishing plot in Ozernaya river (Minutes No. 5 dated 05/21/2019) was changed. It was recommended to cancel the regime 2 fishing days – 2 passing days and to establish the following regime of passing days - Monday, Tuesday, weekly (Minutes No. 20 dated August 9, 2019).

Based on the timely information received in the fishing season of 2019, changes were made to the previously established passing days regime (Minutes No. 11 of July 15, 2019, No. 12 of July 18, 2019 and No. 18 of August 5, 2019):

- to cancel passing days on July 16, July 17 on sea fishing plots of industrial, traditional fishing in the West Kamchatka subzone;

- to set the passing days in the basin of the river Koshegochek - from July 22 to August 25 - Thursday, Friday weekly, from August 26 to the end of fishing - Thursday, Friday, Saturday;

- to cancel the passing day on July 23 in sea fishing plots of industrial, traditional fishing in the Kamchatka-Kuril subzone;

- cancel the passing day on August 5 from 15:00 and passing days 06 of August, 12 August and 13 August in the RLN Kikhchik rivers Pymta Kohl.

The decision to ban the industrial and traditional fishing of Pacific salmon and char in the West Kamchatka and Kamchatka-Kuril subzones from September 23 was adopted at a meeting of the Commission on September 17, 2019 (Protocol No. 27) .

**Chapter 6. Report on monitoring improvement measures in 2019 for sockeye salmon (excluding sockeye salmon harvest in Ozernaya river) and coho salmon, caught by Delta. Sockeye and coho salmon escapement data in the certified rivers**

The methodology of aerovisual monitoring surveys developed in the second half of the XX century by specialists “Kamchatka NIRO “ has not changed significantly until now (Ostroumov, 1962). Though technical equipment was upgraded: aircrafts of new models, satellite navigation, unmanned aerial vehicles (UAVs), cartographic programs and geographic information systems.

Over the previous two decades, with the rapidly growing cost of aircraft, the issue of optimizing aerovisual counting works caused by a funding shortage has become urgent. As a result, the methodology of aerovisual studies was supplemented with a list of rivers based on their contribution to the reproduction of different species of Pacific salmon in Kamchatka (Shevlyakov and Maslov, 2011). Nevertheless, the basic approach to organizing and conducting aerovisual monitoring works remained the same.

Aerovisual survey improvements should be evaluated from the standpoint of the flight time amount which is one of the necessary criteria for the objective assessment, expressed in the coverage of the surveyed area.

Such species of Pacific salmon as pink salmon, chum salmon and sockeye salmon are estimated fairly objectively due to the fact that period of spawning migration of these species largely overlap. This allows to conduct up to three aerovisual surveys for each species. For small species such as chinook and coho, taking into account the period of their spawning migration, it is necessary to organize separate flight. However, the reduced funding does not always make it possible. Therefore, more often the stock assessment of chinook salmon is carried out according to the residual principle, and as far as coho salmon is concerned, fish of early run are counted. This kind of assessments are inevitable, since they are carried out during counting of sockeye salmon, chum salmon, and pink salmon, and accordingly, the validity of the obtained assessments is low.

The consistent decrease in research funding over the past decade has affected the volume of aerovisual surveys, reaching its minimum in 2015 (Fig. 6.1). After that, with the financial aid from some fishing companies, the volume of aerovisual studies was gradually restored, and by 2019 reached the level of 2010, which allowed expanding the geography of flights to count the Pacific salmon in the rivers of the western coast of Kamchatka. Starting in 2018, the Golygin, Koshegochek, and Ozernaya rivers were included in the air monitoring program (spawning grounds in the river fishing plots). The amount of flight time allocated for the examination of river systems on the western coast of Kamchatka increased from 18 hours (2015) to 73 hours (2018). In 2019, the amount of flight time in the west decreased slightly and amounted to 69 hours, which led to a reduction in



survey scope (Fig. 6.1). This circumstance is caused by adverse weather conditions in the first half of September. This explains the underestimation of spawners of chum, coho and salmon.

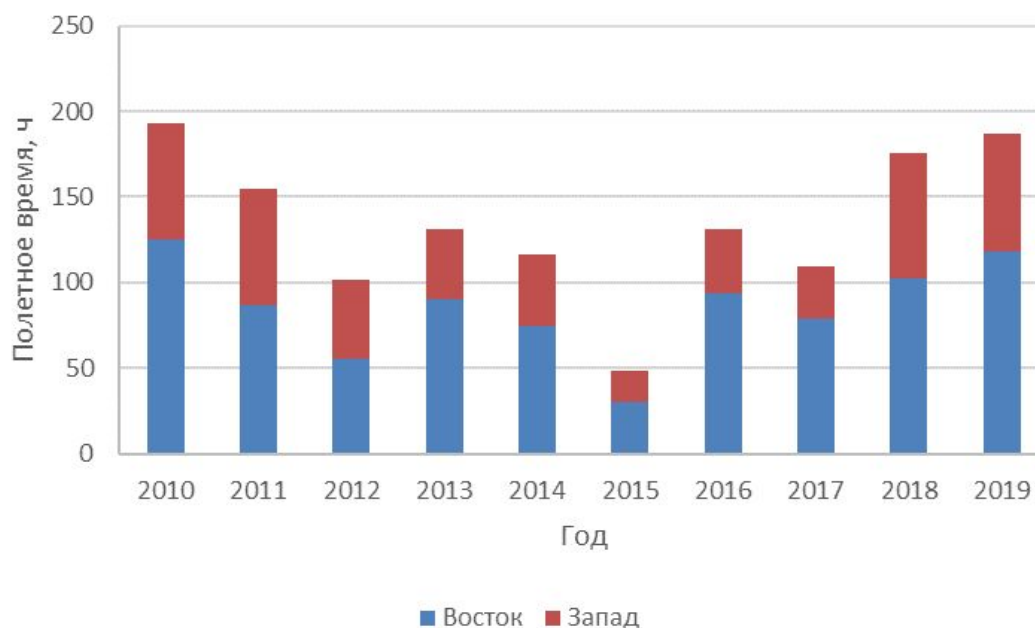


Figure 6.1 - Distribution of flight time allocated for the survey of spawning rivers in the rivers of Western and Eastern Kamchatka

Data on the number of escaped sockeye salmon spawners and coho in 2019, in certified rivers are presented in more details in Chapter 8 (Table . 8 . 2 ).

## **Chapter 7. Law enforcement measures by SVTU and fishing companies to combat illegal fishing, including the scope of work and any violations in 2019**

In 2019 officials of the North-Eastern Territorial Department of the Federal Fishery Agency ( SVTU ) in Kamchatsk kray revealed 272 violations in terms of illegal harvest (catch) of Pacific salmon in inland waters. The biomass of seized salmon was 132 1 4.5 kg (Table 7.1).

Table 7.1 - Detected violations regarding illegal harvest (catch) of Pacific salmon in inland waters of Kamchatka in 2019

<b>District of Kamchatka Territory</b>	<b>Number of detected violations</b>	<b>Pacific salmon, kg</b>
Yelizovsky and Ust-Bolsheretsky districts	182	6800.5
Milkovsky, Sobolevsky and Bystrinsky districts	38	3220.9
Ust-Kamchatsky district	45	1316.8
Koryak district	7	1876.3
<i>Total</i>	<i>272</i>	<i>13214.5</i>

As part of SVTU cooperation with law enforcement and regulatory authorities during the Salmon fishing season - 2019, during joint control and surveillance inspections in the inland waters of the Kamchatka Territory, 189 cases of illegal harvesting (catching) of Pacific salmon were identified , 12,996 kg were seized.

Moreover, in order to identify and combat transportation of illegally obtained biological resources during the fishing season, SVTU together with law enforcement officers organized 6 day-and-night stationary posts. In total, 20 offenses were revealed, 49215 kg of fish products were seized.

In turn, the Border Service of the FSB for the eastern Arctic region in the fishing areas of the Kamchatka Territory in 2019 revealed 55 offenses related to the illegal harvesting (catch) of Pacific salmon. The biomass of seized salmon was 28903 kg (Table 7.2).

Table 7.2 - Detected violations of the illegal harvesting (catch) of Pacific salmon in the fishing areas of the Kamchatka Territory in 2019

Zone, subzone	Number of violations detected	Pacific salmon, kg
West Bering Sea	9	202
Karaginsky subzone	7	76
Petropavlovsk-Komandorsky subzone	23	28447
West Kamchatka and Kamchatka-Kuril subzones	16	178
<i>Total</i>	<i>55</i>	<i>28903</i>

**Chapter 8 Aerovisual survey data and coho salmon and sockeye salmon escapement surveys conducted in 2019, comparative analysis with the data of aerovisual surveys in 2016–2018**

Figure 8.1 shows flight routes for counting the number of Pacific salmon spawners conducted in 2019, including routes in target river basins. In the rivers of the west coast, work was carried out from July 22 to October 13.

Figure 8.1 - Flight routes for counting Pacific salmon stock in 2019

Table 8.1 - Timeline for aerovisual surveys of Pacific salmon in target rivers in 2019

Date	River	View
25.07	Opala	Chinook salmon, chum salmon
05.08	Opala	Chinook salmon, chum salmon
23.08	Opala	sockeye salmon, chum salmon, pink salmon
23.08	Golygina	sockeye salmon, chum salmon, pink salmon
23.08	Ozernaya	sockeye salmon, chum salmon, pink salmon

18.09	Ozernaya	sockeye salmon, chum salmon, pink salmon
12.10.	Opala	sockeye salmon, coho salmon
12.10.	Golygina	sockeye salmon, coho salmon

Table 8 . 2 - The number of Pacific salmon spawners escaped to the target rivers in 2016–2019. thousand spawners

River	PINK				CHUM			
	2016	2017	2018	2019	2016	2017	2018	2019
OPALA GOLYGINA	no data	no data	749.75	12.8	no data	44.6	138.76	98
OZERNAYA	no data	no data	2.75	7.5	no data	no data	0.6	0.9
	COHO				SOCKEYE			
OPALA GOLYGINA	no data	no data	10.5	1.9	no data	1.9	25,305	51.65
OZERNAYA	no data	no data	no data	no data	1826	2350	1778.5	1830

## CONCLUSION

The analysis of stocks status and Pacific salmon fishery management in some rivers of the south-western coast of Kamchatka (r. Ozernaya and Opala ) conducted under an agreement with LLC "Delta" (scientific support for MSC audit of Pacific salmon fishery) allowed us to evaluate current trends in the development of fisheries and to determine the basic principles of rational management of salmon stocks in this region .

In 2019, the target escapement goal for sockeye salmon in Ozernaya river was fully met. This species is the main salmon resource in this water reservoir. The value of pink salmon and chum salmon stocks are not insignificant in this water reservoir. This year, the counted number of these species in the spawning

grounds of Ozernaya river was below the optimal levels. However, it must be taken into account that aerovisual surveys in this river system are not focused on both of these two species. In addition, meteorological conditions did not allow to conduct full aerovisual monitoring. Therefore, it is possible to underestimate the number of pink salmon and chum salmon spawners in the spawning grounds of Ozernaya river. In addition, in Western Kamchatka pink salmon of odd year generation line historically corresponds to low-harvest line.

The basin Opala river in 2019 has recorded a high abundance of chum and sockeye salmon, which exceeded the target escapement goals. However, pink salmon escapement level was below the optimal indicators. But, it should be taken into account, odd years are not highly productive for this species in the basin of Opala river.

In general, the research results indicate that the existing Delta fishery does not have a negative impact on the stocks of Pacific salmon reproduced in the studied rivers of Western Kamchatka .

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