

Marked Salmon Production by the Hatcheries of Russia in 2012

by

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Abstract

The process of salmon marking has been carrying out over 15 years in the hatcheries of Far East of Russia. First of all it is aimed at the estimation of hatchery effectiveness. The release amount of marked juvenile salmon increased considerably within the last years, due to the mass marking in Sakhalin-Kurile region, the place where a lot of hatcheries of Russia are located. The marking was conducted using two methods: «dry» and thermal.

The release of marked juvenile salmon by Russian hatcheries in 2012

Approximately 484 million marked juvenile salmon have been released by the hatcheries of the Far East in 2012 (tab. 1). In total, the salmon marking has been carried out at 26 hatcheries of Russia, including 18 hatcheries of Sakhalin-Kurile region, 4 hatcheries of Kamchatka, 4 hatcheries of Magadan.

The major part of the released marked juveniles is chum – 343.1 million fishes (the increase is 5% comparing to 2011). Less than 25% of pink were marked in 2012. The same situation is with sockeye, however 4 times more coho were marked comparing to 2011.

Table 1. Marked juvenile salmon production by the hatcheries of Russia in 2012

State/ province	NUMBER OF RELEASED, mln. species.						% from total amount
	Chum	Coho	Chinook	Sockeye	Pink	All species	
Magadan	9,85	2,94	0	0	0	12,79	2,64
Kamchatka	28,24	0,66	0,91	4,54	0	34,35	7,1
Sakhalin	224,99	0	0	0	52,79	277,78	57,39
Iturup	80	0	0	0	79,13	159,13	32,87
Total	343,08	3,6	0,91	4,54	131,92	484,05	100
% from total	70,88	0,74	0,19	0,94	27,25	100	

Sockeye is 0.94%, coho is 0.74 % and chinook is 0.19 % from the total mass of marked juveniles. The considerable amount of marked juveniles (over 90%) has been released by hatcheries of Sakhalin-Kurile region.

The total mass of marked Pink salmon has been released by the hatcheries of Sakhalin-Kurile region (see fig. 1).

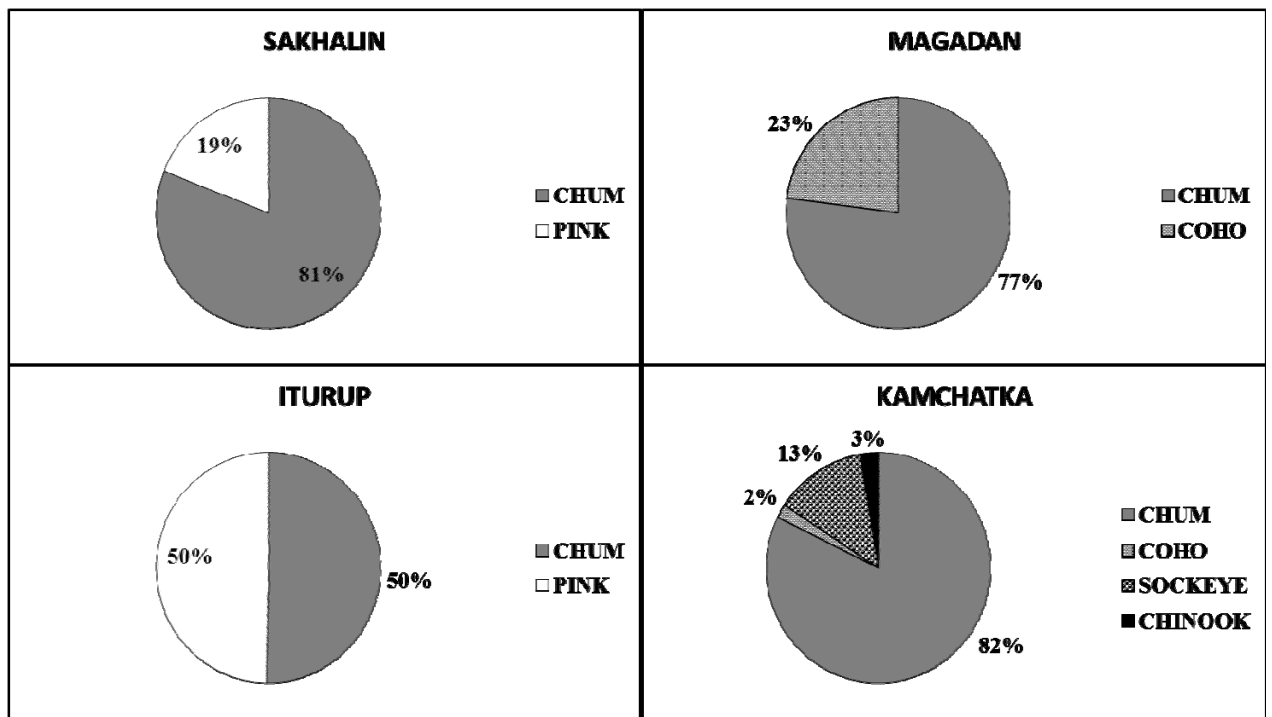


Fig. 1. Marked salmon release from the hatcheries of the Far East of Russia

32 unique marks were used for marking. There are 25 marks for chum, 6 marks for coho, 9 marks for pink, 3 marks for sockeye, 1 mark for chinook. In the case when it was possible, the same mark was used for all rearing salmon species at the same hatchery. The marking in general (in 80% of cases) was conducted using the «dry» method and at the «prehatch» stage (72%).

The data characterizing the marked juvenile brood of 2011 is shown in the Table 2.

The thermal marking pattern is presented as the RBr notation (Munk and Geiger 1998; Hagen 1999) and Hatch code notation (Hagen et al. 2000).

References

Hagen, P. 1999. A modeling approach to address the underlying structure and constraints of thermal mark codes and code notation. (NPAFC Doc. 395) 12 p. Alaska Department of Fish and Game, Juneau, Alaska 99801-5526, USA.

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Munk, K. M., and H. J. Geiger. 1998. Thermal marking of otoliths: the "RBr" coding structure of thermal marks. (NPAFC Doc. 367) 19 p. CWT & Otolith Processing Lab., Alaska Department of Fish and Game, Juneau, Alaska, USA.

Table 2. Marked salmon production by the hatcheries of Russia in 2012

ID#	MARK	BROOD	YEAR OF	SPECIES	COUNTRY	STATE/	AGENCY	FACILITY
	TYPE	YEAR	RELEASE			PROVINCE		
1	2	3	4	5	6	7	8	9
RU11-01	DM	2011	2012	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU11-02	DM	2011	2012	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU11-03	DM	2011	2012	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU11-04	DM	2011	2012	CHUM	RUSSIA	MAGADAN	MAGADANNIRO	OL'SKY HATCHERY
RU11-05	DM	2011	2012	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU11-06	DM	2011	2012	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	YANSKY HATCHERY
RU11-07	DM	2011	2012	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU11-08	TM	2011	2012	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	PARATUNSKY HATCHERY
RU11-09	DM	2011	2012	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU11-10	DM	2011	2012	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	OZERKOVSKY HATCHERY
RU11-11	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ADO-TYMOVSKY HATCHERY
RU11-12	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ADO-TYMOVSKY HATCHERY
RU11-13	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ADO-TYMOVSKY HATCHERY
RU11-14	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ADO-TYMOVSKY HATCHERY
RU11-15	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	POBEDINSKY HATCHERY
RU11-16	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BUYUKLOVSKY HATCHERY
RU11-17	TM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU11-18	TM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU11-19	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU11-20	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU11-21	TM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BEREZNYAKOVSKY HATCHERY
RU11-22	TM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BEREZNYAKOVSKY HATCHERY
RU11-23	TM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BEREZNYAKOVSKY HATCHERY
RU11-24	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	KALININSKY HATCHERY
RU11-25	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOL'NIKOVSKY HATCHERY
RU11-26	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	YASNOMORSKY HATCHERY
RU11-27	TM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	TARANAYSKY HATCHERY
RU11-28	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU11-29	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU11-30	DM	2011	2012	CHUM	RUSSIA	ITURUP	GIDROSTROY	KURIL'SKY HATCHERY

Table 2 (Continuation). Marked salmon production by the hatcheries of Russia in 2012

ID#	STOCK	FINAL	STAGE	NUMBER OF	HATCH CODE	RBr
		RELEASE SITE		RELEASED		
1	10	11	12	13	14	15
RU11-01	KUL'KUTY RIVER	OLA RIVER	FED FRY	2100027	4,1nH	1:1.4,2.1n
RU11-02	KUL'KUTY RIVER	STARAYA VESELAYA BAY	FED FRY	1538300	4,1nH	1:1.4,2.1n
RU11-03	OLA RIVER	OLA RIVER	FED FRY	710245	3,2nH	1:1.3,2.2n
RU11-04	KUL'KUTY RIVER	KUL'KUTY RIVER	FED FRY	3191400	4,1nH	1:1.4,2.1n
RU11-05	KUL'KUTY RIVER	OKSA RIVER	FED FRY	680500	4,1nH	1:1.4,2.1n
RU11-06	YANA RIVER	YANA RIVER	FED FRY	968000	1,2,1H	1:1.1,2,2,3.1
RU11-07	YAMA RIVER	OKSA RIVER	FED FRY	667000	5H	1:1.5H
RU11-08	PARATUNKA RIVER	PARATUNKA RIVER	FED FRY	20384200	H1,3,1	2:1.1,2,3,3.1
RU11-09	AVACHA RIVER	AVACHA RIVER	FED FRY	6861802	5,2H	1:1.5,2.2
RU11-10	BOL'SHAYA RIVER	BOL'SHAYA RIVER	FED FRY	992465	3,5H	1:1.3,2.5
RU11-11	TYM' RIVER	TYM' RIVER	FED FRY	3544700	3,2,1H	1:1.3,2,2,3.1
RU11-12	TYM' RIVER	TYM' RIVER	FED FRY	8388800	3,2,2H	1:1.3,2,2,3.2
RU11-13	BUYUKLINKA RIVER	TYM' RIVER	FED FRY	4186700	3,2,2H	1:1.3,2,2,3.2
RU11-14	PORONAY RIVER	TYM' RIVER	FED FRY	1126700	3,2,2H	1:1.3,2,2,3.2
RU11-15	PORONAY RIVER	PORONAY RIVER	FED FRY	17389000	1,3n,1H	1:1.1,2,3n,3.1
RU11-16	BUYUKLINKA RIVER	BUYUKLINKA RIVER	FED FRY	38773300	7H	1:1.7
RU11-17	NAYBA RIVER	BELAYA RIVER	FED FRY	1848000	H1,4,1	2:1.1,2,4,3.1
RU11-18	FIRSOVKA RIVER	BELAYA RIVER	FED FRY	11916300	H1,4,1	2:1.1,2,4,3.1
RU11-19	NAYBA RIVER	BELAYA RIVER	FED FRY	1769800	1,4,1H1,4,1	1:1.1,2,4,3.1+4.1,5,4,6.1
RU11-20	FIRSOVKA RIVER	BELAYA RIVER	FED FRY	7982900	1,4,1H1,4,1	1:1.1,2,4,3.1+4.1,5,4,6.1
RU11-21	NAYBA RIVER	BOL'SHOY TAKOY RIVER	FED FRY	2156700	H6	2:1.6
RU11-22	TARANAY RIVER	BOL'SHOY TAKOY RIVER	FED FRY	3182600	H6	2:1.6
RU11-23	FIRSOVKA RIVER	BOL'SHOY TAKOY RIVER	FED FRY	23329700	H6	2:1.6
RU11-24	KALINKA RIVER	KALINKA RIVER	FED FRY	37019200	3n,3nH	1:1.3n,2,3n
RU11-25	ZAVETINKA RIVER	ZAVETINKA RIVER	FED FRY	15690000	3n,2,1H	1:1.3n,2,2,3.1
RU11-26	YASNOMORKA RIVER	YASNOMORKA RIVER	FED FRY	17485100	1,2H	1:1.1,2.2
RU11-27	TARANAY RIVER	TARANAY RIVER	FED FRY	1907300	H3,2	2:1.3,2.2
RU11-28	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	4336000	3n,2H	1:1.3n,2.2
RU11-29	ZAVETINKA RIVER	CHERNAYA RIVER	FED FRY	1716000	3n,2H	1:1.3n,2.2
RU11-30	KURILKA RIVER	KURILKA RIVER	FED FRY	14200000	4,3H	1:1.4,2,3

Table 2 part 2. Marked salmon production by the hatcheries of Russia in 2012

ID#	MARK	BROOD	YEAR OF	SPECIES	COUNTRY	STATE/	AGENCY	FACILITY
	TYPE	YEAR	RELEASE			PROVINCE		
1	2	3	4	5	6	7	8	9
RU11-31	TM	2011	2012	CHUM	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU11-32	DM	2011	2012	CHUM	RUSSIA	ITURUP	GIDROSTROY	HATCHERY ON BAY OLYA
RU11-33	DM	2011	2012	CHUM	RUSSIA	ITURUP	GIDROSTROY	HATCHERY ON BAY OLYA
RU11-34	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	GIDROSTROY	KITOVYY HATCHERY
RU11-35	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	PILENGA GODO	ZALOM HATCHERY
RU11-36	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	PILENGA GODO	MONETKA HATCHERY
RU11-37	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	PILENGA GODO	MONETKA HATCHERY
RU11-38	DM	2011	2012	CHUM	RUSSIA	SAKHALIN	PILENGA GODO	MONETKA HATCHERY
RU11-39	DM	2011	2012	PINK	RUSSIA	SAKHALIN	SAKHALINRYBVOD	TARANAYSKY HATCHERY
RU11-40	DM	2011	2012	PINK	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ANIVSKY HATCHERY
RU11-41	DM	2011	2012	PINK	RUSSIA	SAKHALIN	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU11-42	DM	2011	2012	PINK	RUSSIA	ITURUP	GIDROSTROY	KURIL'SKY HATCHERY
RU11-43	DM	2011	2012	PINK	RUSSIA	ITURUP	GIDROSTROY	KURIL'SKY HATCHERY
RU11-44	DM	2011	2012	PINK	RUSSIA	ITURUP	GIDROSTROY	KURIL'SKY HATCHERY
RU11-45	TM	2011	2012	PINK	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU11-46	DM	2011	2012	PINK	RUSSIA	SAKHALIN	PILENGA GODO	MONETKA HATCHERY
RU11-47	DM	2011	2012	PINK	RUSSIA	SAKHALIN	PILENGA GODO	MONETKA HATCHERY
RU11-48	DM	2011	2012	PINK	RUSSIA	SAKHALIN	PILENGA GODO	MONETKA HATCHERY
RU11-49	DM	2011	2012	PINK	RUSSIA	SAKHALIN	PILENGA GODO	MONETKA HATCHERY
RU11-50	DM	2011	2012	COHO	RUSSIA	MAGADAN	OKHOTSKRYBVOD	YANSKY HATCHERY
RU11-51	DM	2011	2012	COHO	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU11-52	DM	2011	2012	COHO	RUSSIA	MAGADAN	OKHOTSKRYBVOD	TAUYSKY HATCHERY
RU11-53	DM	2011	2012	COHO	RUSSIA	MAGADAN	OKHOTSKRYBVOD	TAUYSKY HATCHERY
RU11-54	DM	2010	2012	COHO	RUSSIA	MAGADAN	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU11-55	DM	2011	2012	COHO	RUSSIA	MAGADAN	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU11-56	TM	2011	2012	COHO	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	PARATUNSKY HATCHERY
RU11-57	TM	2011	2012	CHINOOK	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	MALKINSKY HATCHERY
RU11-58	TM	2011	2012	SOCKEYE	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	MALKINSKY HATCHERY
RU11-59	DM	2011	2012	SOCKEYE	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	OZERKOVSKY HATCHERY
RU11-60	DM	2011	2012	SOCKEYE	RUSSIA	KAMCHATKA	KAMCHATNIRO	OZERKOVSKY HATCHERY

Table 2 part 2 (continuation). Marked salmon production by the hatcheries of Russia in 2012

ID#	STOCK	FINAL	STAGE	NUMBER OF	HATCH CODE	RBr
		RELEASE SITE		RELEASED		
1	10	11	12	13	14	15
RU11-31	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	35846900	H1,4	2:1.1,2,4
RU11-32	OLYA RIVER	OLYA RIVER	FED FRY	5000000	3,3H	1:1.3,2,3
RU11-33	REYDOVAYA RIVER	OLYA RIVER	FED FRY	24961000	3,3H	1:1.3,2,3
RU11-34	KURILKA RIVER	KITOVAYA RIVER	FED FRY	2603500	3,2,1H	1:1.3,2,2,3,1
RU11-35	ZALOM RIVER	ZALOM RIVER	FED FRY	9446200	3,4H	1:1.3,2,4
RU11-36	OSTROVKA RIVER	CHIRKOVA RIVER	FED FRY	1378800	3,2n,1H	1:1.3,2,2n,3,1
RU11-37	OSTROVKA RIVER	OSTROVKA RIVER	FED FRY	5778400	3,2n,1H	1:1.3,2,2n,3,1
RU11-38	OSTROVKA RIVER	OSTROVKA RIVER	FED FRY	2036200	3n,1H	1:1.3n,2,1
RU11-39	TARANAY RIVER	TARANAY RIVER	FED FRY	12721200	3,2H	1:1.3,2,2
RU11-40	BYSTRAYA RIVER	BYSTRAYA RIVER	FED FRY	16107600	5,1H	1:1.5,2,1
RU11-41	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	537200	3n,2H	1:1.3n,2,2
RU11-42	KURILKA RIVER	KURILKA RIVER	FED FRY	15700000	4,3H	1:1.4,2,3
RU11-43	KURILKA RIVER	KURILKA RIVER	FED FRY	19300000	1,4,1H	1:1.1,2,4,3,1
RU11-44	KURILKA RIVER	KURILKA RIVER	FED FRY	16394000	1,2,4H	1:1.1,2,2,3,4
RU11-45	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	27732227	H1,4	2:1.1,2,4
RU11-46	OSTROVKA RIVER	OSTROVKA RIVER	FED FRY	7318700	3n,1H	1:1.3n,2,1
RU11-47	OSTROVKA RIVER	OSTROVKA RIVER	FED FRY	10526600	4n,1,2H	1:1.4n,2,1,3,2
RU11-48	OSTROVKA RIVER	CHIRKOVA RIVER	FED FRY	2242200	4n,1,2H	1:1.4n,2,1,3,2
RU11-49	OSTROVKA RIVER	IGRIVAYA RIVER	FED FRY	3338400	4n,1,2H	1:1.4n,2,1,3,2
RU11-50	YANA RIVER	YANA RIVER	FED FRY	1109300	1,2,1H	1:1.1,2,2,3,1
RU11-51	OLA RIVER	UGLIKANKA RIVER	FED FRY	98000	3,2nH	1:1.3,2,2n
RU11-52	IGONDZHA RIVER	IGONDZHA RIVER	FED FRY	90181	4,1nH	1:1.4,2,1n
RU11-53	YANA RIVER	IGONDZHA RIVER	FED FRY	496119	4,1nH	1:1.4,2,1n
RU11-54	ARMAN RIVER	ARMAN RIVER	YEARLING	222000	1,3,1H	1:1.1,2,3,3,1
RU11-55	ARMAN RIVER	ARMAN RIVER	FED FRY	920200	5H	1:1.5
RU11-56	PARATUNKA RIVER	PARATUNKA RIVER	FED FRY	659900	H1,3,1	2:1.1,2,3,3,1
RU11-57	BOL`SHAYA RIVER	BOL`SHAYA RIVER	FED FRY	910904	H3,4	2:1.3,2,4
RU11-58	BOL`SHAYA RIVER	BOL`SHAYA RIVER	FED FRY	569230	3,4H	1:1.3,2,4
RU11-59	BOL`SHAYA RIVER	BOL`SHAYA RIVER	FED FRY	3904551	3,5H	1:1.3,2,5
RU11-60	BOLSHAYA RIVER	LISTVENNICHNOE LAKE	FED FRY	67341	5H	1:1.5