

## **Marked salmon production by the hatcheries of Russia in 2010**

by

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## Marked salmon production by the hatcheries of Russia in 2010

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### Abstract

Salmon marking at the hatcheries of the Far East of Russia has been conducted for more than 15 years and it is done, first of all, to evaluate the efficiency of the hatcheries. The number of marked salmon release has lately increased as the result of their marking in Sakhalino-Kurilski region where the biggest number of hatcheries is located.

### Marked salmon production by the hatcheries of Russia in 2010

About 455 million of otolith marked salmon were released by the hatcheries located in the Far East in 2010. They were released from four hatcheries in Magadan region, five hatcheries located in Kamchatka, one – in Khabarovsk region and thirteen in Sakhalino-Kurilski region. Totally the otolith marking was conducted at 23 hatcheries of Russia.

The major part of released marked salmon is chum – 288,12 million specimen and pink – 157,7 million specimen (Table 1).

Table 1

Number of otolith marked salmon production in regions of Russia in 2010

State/ province	NUMBER OF RELEASED, million specimen						% from total amount
	Chum	Coho	Chinook	Sockeye	Pink	All specimen	
Magadan	5.98	2.18	0.00	0.00	0.00	8.16	1.8
Khabarovsk	4.70	0.00	0.00	0.00	0.00	4.70	1.0
Kamchatka	28.33	1.07	0.88	5.21	0.00	35.49	7.8
Sakhalin	211.04	0.52	0.00	0.00	66.66	278.22	61.1
Iturup	38.07	0.00	0.00	0.00	91.05	129.12	28.3
Total in Russia	288.12	3.78	0.88	5.21	157.71	455.69	100.0
% from total amount	63.2	0.8	0.2	1.2	34.6	100.0	

Sockeye and coho made up 1,2% and 0,8% from the total amount of marked salmon. Besides 0,88 million of marked chinook was also released.

A considerable amount of marked salmon (more than 89%) was released by the hatcheries of Sakhalino-Kurilski region.

38 unique marks were used in the process of marking. 30 marks for chum, 4 – for coho, 2 – for sockeye, 10 – for pink, and 1 – for chinook. If it was possible only one type of mark was used for all types of replicated salmon.

The data which characterize type of marking and marks of juvenile salmon of the generation of 2009 are given in the Tables 2-3.

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 2010

ID#	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	AGENCY	FACILITY
1	2	3	4	5	6	7	8	9
RU09-01	DM	2009	2010	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU09-02	DM	2009	2010	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU09-03	DM	2009	2010	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU09-04	DM	2009	2010	CHUM	RUSSIA	MAGADAN	MAGADANNIRO	OL'SKY HATCHERY
RU09-05	DM	2009	2010	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	TAUYSKY HATCHERY
RU09-06	DM	2009	2010	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	YANSKY HATCHERY
RU09-07	DM	2009	2010	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU09-08	DM	2009	2010	CHUM	RUSSIA	KHABAROVSK	OOO "KOMETA"	KOMETA HATCHERY
RU09-09	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU09-10	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU09-11	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU09-12	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU09-13	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU09-14	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU09-15	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU09-16	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU09-17	DM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	OZERKOVSKY HATCHERY
RU09-18	TM	2009	2010	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	PARATUNSKY HATCHERY
RU09-19	DM, TM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ADO-TYMOVSKY HATCHERY
RU09-20	TM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ADO-TYMOVSKY HATCHERY
RU09-21	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ANIVSKY HATCHERY
RU09-22	DM, TM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BEREZNYAKOVSKY HATCHERY
RU09-23	TM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BEREZNYAKOVSKY HATCHERY
RU09-24	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BUYUKLOVSKY HATCHERY
RU09-25	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	KALININSKY HATCHERY
RU09-26	DM, TM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	POBEDINSKY HATCHERY
RU09-27	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	POBEDINSKY HATCHERY
RU09-28	TM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU09-29	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOL'NIKOVSKY HATCHERY
RU09-30	TM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	TARANAYSKY HATCHERY
RU09-31	TM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	TARANAYSKY HATCHERY
RU09-32	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU09-33	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU09-34	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU09-35	DM	2009	2010	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	YASNOMORSKY HATCHERY
RU09-36	DM	2009	2010	CHUM	RUSSIA	ITURUP	GIDROSTROY	KURIL'SKY HATCHERY
RU09-37	DM	2009	2010	CHUM	RUSSIA	ITURUP	GIDROSTROY	KURIL'SKY HATCHERY
RU09-38	DM	2009	2010	CHUM	RUSSIA	ITURUP	GIDROSTROY	KURIL'SKY HATCHERY
RU09-39	TM	2009	2010	CHUM	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU09-40	TM	2009	2010	CHUM	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU09-41	TM	2009	2010	CHUM	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY

Table 2 (Continuation). Marked salmon production by the hatcheries of Russia in 2010

ID#	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	AGENCY	FACILITY
1	2	3	4	5	6	7	8	9
RU09-42	DM	2009	2010	COHO	RUSSIA	MAGADAN	OKHOTSRYBOD	YANSKY HATCHERY
RU09-43	TM	2009	2010	COHO	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	PARATUNSKY HATCHERY
RU08-32	DM	2008	2010	COHO	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	VILYUYSKY HATCHERY
RU09-44	DM, TM	2009	2010	COHO	RUSSIA	SAKHALIN	SAKHALINRYBOD	ADO-TYMOVSKY HATCHERY
RU09-45	TM	2009	2010	CHINOOK	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	MALKINSKY HATCHERY
RU09-46	TM	2009	2010	CHINOOK	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	MALKINSKY HATCHERY
RU09-47	TM	2009	2010	CHINOOK	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	MALKINSKY HATCHERY
RU09-48	TM	2009	2010	SOCKEYE	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	MALKINSKY HATCHERY
RU09-49	DM	2009	2010	SOCKEYE	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	OZERKOVSKY HATCHERY
RU09-50	DM	2009	2010	PINK	RUSSIA	SAKHALIN	SAKHALINRYBOD	ANIVSKY HATCHERY
RU09-51	TM	2009	2010	PINK	RUSSIA	SAKHALIN	SAKHALINRYBOD	SOKOLOVSKY HATCHERY
RU09-52	DM	2009	2010	PINK	RUSSIA	SAKHALIN	SAKHALINRYBOD	TARANAYSKY HATCHERY
RU09-53	TM	2009	2010	PINK	RUSSIA	SAKHALIN	SAKHALINRYBOD	TARANAYSKY HATCHERY
RU09-54	DM	2009	2010	PINK	RUSSIA	SAKHALIN	SAKHALINRYBOD	UROZHAYNYY HATCHERY
RU09-55	DM	2009	2010	PINK	RUSSIA	SAKHALIN	SAKHALINRYBOD	UROZHAYNYY HATCHERY
RU09-56	DM	2009	2010	PINK	RUSSIA	ITURUP	GIDROSTROY	KURIL'SKY HATCHERY
RU09-57	TM	2009	2010	PINK	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU09-58	DM, TM	2009	2010	PINK	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU09-59	DM, TM	2009	2010	PINK	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY

Table 3. Otolith marks and number of marked salmon released in Russia in 2010

ID#	STOCK	FINAL RELEASE SITE	STAGE	NUMBER OF RELEASED	RBr	HATCH CODE
1	10	11	12	13	14	15
RU09-01	STARAYA VESELAYA RIVER	STARAYA VESELAYA BAY	FED FRY	1027246	1:1.4,2.3n	4,3nH
RU09-02	LANKOVAYA RIVER	LANKOVAYA RIVER	FED FRY	299964	1:1.4,2.3n	4,3nH
RU09-03	KUL`KUTY RIVER	KUL`KUTY RIVER	FED FRY	405351	1:1.5	5H
RU09-04	KUL`KUTY RIVER	KUL`KUTY RIVER	FED FRY	726700	1:1.5	5H
RU09-05	CHUKCHA RIVER	TAUY RIVER	FED FRY	174000	1:1.3n-2.3n	3n-3nH
RU09-06	YANA RIVER	YANA RIVER	FED FRY	1366020	1:1.7	7H
RU09-07	YAMA RIVER	OKSA RIVER	FED FRY	1979500	1:1.4,2.3	4,3H
RU09-08	TIKHOE LAKE	GYZHU	FED FRY	4700000	1:1.3,2.1,3.3	3,1,3H
RU09-09	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	818111	1:1.3,2.2,3.2	3,2,2H
RU09-10	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	1233441	1:1.3,2.2,3.2	3,2,2H
RU09-11	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	1235274	1:1.3,2.2,3.2	3,2,2H
RU09-12	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	1279197	1:1.3,2.2,3.2	3,2,2H
RU09-13	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	1300480	1:1.3,2.2,3.2	3,2,2H
RU09-14	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	1728057	1:1.3,2.2,3.2	3,2,2H
RU09-15	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	1728390	1:1.3,2.2,3.2	3,2,2H
RU09-16	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	1299982	1:1.3,2.2,3.2	3,2,2H
RU09-17	BOL`SHAYA RIVER	PLOTNIKOVA RIVER	FED FRY	1117040	1:1.3,2.3	3,3H
RU09-18	PARATUNKA RIVER	TREZUBETC SPRING	FED FRY	16594000	2:1.9	H9
RU09-19	TYM' RIVER	TYM' RIVER	FED FRY	778700	1:1.1,2,3,3.1+4.1,5,3,6.1	1,3,1H1,3,1
RU09-20	TYM' RIVER	TYM' RIVER	FED FRY	25943900	2:1.1,2,3,3.1	H1,3,1
RU09-21	BYSTRAYA RIVER	BYSTRAYA RIVER	FED FRY	455800	1:1.3,2.2	3,2H
RU09-22	BOL`SHOY TAKOY RIVER	BOL`SHOY TAKOY RIVER	FED FRY	1328100	1:1.4,2.2+3.4,4.2	4,2H4,2
RU09-23	BOL`SHOY TAKOY RIVER	BOL`SHOY TAKOY RIVER	FED FRY	25570800	2:1.4,2.2	H4,2
RU09-24	BUYUKLINKA RIVER	BUYUKLINKA RIVER	FED FRY	33970000	1:1.1,2,2,3.4	1,2,4H
RU09-25	KALINKA RIVER	KALINKA RIVER	FED FRY	35500000	1:1.3-2.3	3-3H
RU09-26	PORONAY RIVER	PORONAY RIVER	FED FRY	4651900	1:1.1,2,2,3,2,4.1+5.1,6,2,7,2,8.1	1,2,2,1H1,2,2,1
RU09-27	PORONAY RIVER	PORONAY RIVER	FED FRY	9898100	1:1.1,2,2,3,2,4.1	1,2,2,1H
RU09-28	BELAYA RIVER	BELAYA RIVER	FED FRY	14464300	2:1.5,2.2	H5,2
RU09-29	ZAVETINKA RIVER	ZAVETINKA RIVER	FED FRY	15560000	1:1.3n,2.1,3.2	3n,1,2H
RU09-30	TARANAY RIVER	TARANAY RIVER	FED FRY	1703100	2:1.1,2.5	H1,5
RU09-31	TARANAY RIVER	TARANAY RIVER	FED FRY	17919900	2:1.1,2.5	H1,5
RU09-32	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	3969400	1:1.3n,2.3	3n,3H
RU09-33	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	752600	1:1.3n,2.2	3n2H
RU09-34	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	1145400	1:1.3n,2.1	3n,1H
RU09-35	YASNOMORKA RIVER	YASNOMORKA RIVER	FED FRY	17423000	1:1.5,2.1	5,1H
RU09-36	KURILKA RIVER	KURILKA RIVER	FED FRY	8337600	1:1.3,2.2,3.2n	3,2,2nH
RU09-37	KURILKA RIVER	KURILKA RIVER	FED FRY	1552800	1:1.3,2.2,3.2n-4.2n	3,2,2n-2nH
RU09-38	KURILKA RIVER	KURILKA RIVER	FED FRY	1778800	1:1.3,2.3,3.2n	3,3,2nH
RU09-39	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	7800000	2:1.1,2,2,3.2	H1,2,2
RU09-40	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	16700000	2:1.1,2,2,3.2	H1,2,2
RU09-41	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	1900000	1:1.1,2,2,3.2	1,2,2H

Table 3. (Continuation). Otolith marks and number of marked salmon released in Russia in 2010

ID#	STOCK	FINAL RELEASE SITE	STAGE	NUMBER OF RELEASED	RBr	HATCH CODE
1	10	11	12	13	14	15
RU09-42	YANA RIVER	YANA RIVER	FED FRY	2181900	1:1.3n,2.3n	3n,3nH
RU09-43	PARATUNKA RIVER	TREZUBETC SPRING	FED FRY	603100	2:1.9	H9
	BOL'SHOY VILYUY LAKE	BOL'SHOY VILYUY LAKE	FED FRY	466335	1:1.3,2.1,3.1	3,1,1H
RU09-44	TYM' RIVER	TYM' RIVER	FED FRY	523800	1:1.1,2.3,3.1+4.1,5.3,6.1	1,3,1H1,3,1
RU09-45	BOL'SHAYA RIVER	KLYUCHYEVKA RIVER	FED FRY	395828	2:1.3,2.1,3.2	H3,1,2
RU09-46	BOL'SHAYA RIVER	KLYUCHYEVKA RIVER	FED FRY	395827	2:1.3,2.1,3.2	H3,1,2
RU09-47	BOL'SHAYA RIVER	KLYUCHYEVKA RIVER	FED FRY	85120	2:1.3,2.1,3.2	H3,1,2
RU09-48	BOL'SHAYA RIVER	KLYUCHYEVKA RIVER	FED FRY	605243	1:1.3,2.1,3.2	3,1,2H
RU09-49	BOL'SHAYA RIVER	PLOTNIKOVA RIVER	FED FRY	4604101	1:1.3,2.3	3,3H
RU09-50	BYSTRAYA RIVER	BYSTRAYA RIVER	FED FRY	25239300	1:1.3,2.2	3,2H
RU09-51	BELAYA RIVER	BELAYA RIVER	FED FRY	25754100	2:1.5,2.2	H5,2
RU09-52	TARANAY RIVER	TARANAY RIVER	FED FRY	3171000	1:1.1,2.5	1,5H
RU09-53	TARANAY RIVER	TARANAY RIVER	FED FRY	1175500	2:1.1,2.5	H1,5
RU09-54	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	10648500	1:1.3n,2.3	3n,3H
RU09-55	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	671600	1:1.3n,2.2	3n,2H
RU09-56	KURILKA RIVER	KURILKA RIVER	FED FRY	48866100	1:1.3,2.3,3.2n	3,2,2nH
RU09-57	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	24030500	2:1.1,2.2,2.2	H1,2,2
RU09-58	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	10855000	1:1.1,2.2,3.2+4.1,5.2,6.2	1,2,2H1,2,2H
RU09-59	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	7300500	1:1.1,2.2,3.1+4.1,5.2,6.2	1,2,1H1,2,2