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Marked Salmon Production by the Hatcheries of Russia in 2009

by

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Abstract

The main goal of salmon marking at Russian hatcheries is the assessment of returns of Pacific salmon released from each hatchery. Additional investigations are performed in Magadan region where survival of wild and hatchery-reared juvenile chum salmon in the early sea life period is evaluated based on the otolith marks differentiation.

Marked salmon production by the hatcheries of Russia in 2009

About 50 million juvenile salmon with marks on otoliths are annually released from four Magadan hatcheries, six Kamchatka hatcheries, and one hatchery of Khabarovsky region. In 2009, besides these hatcheries, salmon marking was performed at Sakhalin and Kuril hatcheries. As a result, there was a significant increase in released marked juveniles, which composed 211 million.

On the whole, salmon marking was performed at 18 Russian hatcheries. Of them, 6 hatcheries are located on Sakhalin Island, 2 on the Kuril Islands (Iturup Island), 4 in Magadan, 5 in Kamchatka, and 1 in Khabarovsky regions.

The marked pink salmon released from Sakhalin and Kuril hatcheries amounted to 104.7 million.

The marked chum salmon released from all hatcheries composed about 94.3 million; of them, 9.6 in Magadan region, 15.2 in Kamchatka, 58.8 on Sakhalin and Kuril Islands, and 10.7 million in Soviet Gavan.

Sockeye and coho salmon were marked in Kamchatka and Magadan regions.

The released marked sockeye salmon amounted to 9.9 million; of them, 0.02 million from Magadan hatcheries and 9.87 million from Kamchatka hatcheries.

In total, ...2.2 million coho salmon were marked; of them, 0.9 million were released from Magadan hatcheries and 1.3 million from Kamchatka hatcheries.

The marked juvenile chinook salmon released from Kamchatka hatcheries amounted to 0.8 million.

The data on released marked juveniles are given in Table 1.

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 1. Marked salmon production by the hatcheries of Russia in 2009

ID#	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	AGENCY	FACILITY
1	2	3	4	5	6	7	8	9
RU08-01	DM	2008	2009	MAGADAN	RUSSIA	CHUM	MAGADANNIRO	OL'SKY HATCHERY
RU08-02	DM	2008	2009	MAGADAN	RUSSIA	CHUM	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU08-03	DM	2008	2009	MAGADAN	RUSSIA	CHUM	OKHOTSKRYBVOD	OL'SKY HATCHERY
RU08-04	DM	2008	2009	MAGADAN	RUSSIA	CHUM	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU08-05	DM	2008	2009	MAGADAN	RUSSIA	CHUM	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU08-06	DM	2008	2009	MAGADAN	RUSSIA	CHUM	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU08-07	DM	2008	2009	MAGADAN	RUSSIA	CHUM	OKHOTSKRYBVOD	YANSKY HATCHERY
RU08-08	DM	2008	2009	MAGADAN	RUSSIA	CHUM	OKHOTSKRYBVOD	TAUYSKY HATCHERY
RU08-09	DM	2008	2009	KHABAROVSK	RUSSIA	CHUM	KOMETA	KOMETA HATCHERY
RU08-10	TM	2008	2009	KAMCHATKA	RUSSIA	CHUM	SEV-VOST RYBVOD	PARATUNSKY HATCHERY
RU08-11	DM	2008	2009	KAMCHATKA	RUSSIA	CHUM	SEV-VOST RYBVOD	KETKINSKY HATCHERY
RU08-12	DM	2008	2009	KAMCHATKA	RUSSIA	CHUM	SEV-VOST RYBVOD	OZERKOVSKY HATCHERY
RU08-13	DM	2008	2009	SAKHALIN	RUSSIA	CHUM	SAKHALINRYBVOD	BUYUKLOVSKY HATCHERY
RU08-14	TM	2008	2009	SAKHALIN	RUSSIA	CHUM	SAKHALINRYBVOD	SOKOL'NIKOVSKY HATCHERY
RU08-15	DM	2008	2009	ITURUP	RUSSIA	CHUM	GIDROSTROY	KURIL'SKY HATCHERY
RU08-16	TM	2008	2009	ITURUP	RUSSIA	CHUM	GIDROSTROY	REYDOVYY HATCHERY
RU08-17	TM	2008	2009	KAMCHATKA	RUSSIA	COHO	SEV-VOST RYBVOD	PARATUNSKY HATCHERY
RU08-18	DM	2008	2009	KAMCHATKA	RUSSIA	COHO	SEV-VOST RYBVOD	VILYUYSKY HATCHERY
RU07-24	DM	2007	2009	MAGADAN	RUSSIA	COHO	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU07-25	DM	2007	2009	MAGADAN	RUSSIA	COHO	OKHOTSKRYBVOD	YANSKY HATCHERY
RU07-26	DM	2007	2009	MAGADAN	RUSSIA	COHO	OKHOTSKRYBVOD	TAUYSKY HATCHERY
RU07-27	DM	2007	2009	MAGADAN	RUSSIA	SOCKEYE	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU08-19	TM	2008	2009	KAMCHATKA	RUSSIA	SOCKEYE	SEV-VOST RYBVOD	MALKINSKY HATCHERY
RU08-20	DM	2008	2009	KAMCHATKA	RUSSIA	SOCKEYE	SEV-VOST RYBVOD	OZERKOVSKY HATCHERY
RU08-21	DM	2008	2009	KAMCHATKA	RUSSIA	SOCKEYE	SEV-VOST RYBVOD	OZERKOVSKY HATCHERY
RU08-22	TM	2008	2009	KAMCHATKA	RUSSIA	CHINOOK	SEV-VOST RYBVOD	MALKINSKY HATCHERY
RU08-23	DM	2008	2009	SAKHALIN	RUSSIA	PINK	SAKHALINRYBVOD	ANIVSKY HATCHERY
RU08-24	TM	2008	2009	SAKHALIN	RUSSIA	PINK	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU08-25	TM	2008	2009	SAKHALIN	RUSSIA	PINK	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU08-26	DM, TM	2008	2009	SAKHALIN	RUSSIA	PINK	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU08-27	TM	2008	2009	SAKHALIN	RUSSIA	PINK	SAKHALINRYBVOD	TARANAYSKY HATCHERY
RU08-28	DM	2008	2009	SAKHALIN	RUSSIA	PINK	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU08-29	DM	2008	2009	ITURUP	RUSSIA	PINK	GIDROSTROY	KURIL'SKY HATCHERY
RU08-30	TM	2008	2009	ITURUP	RUSSIA	PINK	GIDROSTROY	REYDOVYY HATCHERY
RU08-31	DM, TM	2008	2009	ITURUP	RUSSIA	PINK	GIDROSTROY	REYDOVYY HATCHERY

ID#	STOCK	FINAL RELEASE SITE	STAGE	NUMBER OF RELEASED	RBr	HATCH CODE	RAPHIC IMAGE	
							PREHATCH	POSTHATCH
1	10	11	12	13	14	15	15	16
RU08-01	KUL'KUTY RIVER	KUL'KUTY RIVER	FED FRY	3070000	1:1.5	5H	I I I I I	
RU08-02	OLA RIVER	UGLIKANKA RIVER	FED FRY	732000	1:1.1,2,2,3,1	1,2,1H	I I I I	
RU08-03	YAMA RIVER	STARAYA VESELAYA BAY	FED FRY	795950	1:1.1,2,3,3,1	1,3,1H	I I I I I	
RU08-04	YAMA RIVER	STARAYA VESELAYA BAY	FED FRY	292328	1:1.1,2,2,3,2	1,2,2H	I I I I I	
RU08-05	YAMA RIVER	SHIROKAYA RIVER	FED FRY	629748	1:1.1,2,2,3,2	1,2,2H	I I I I I	
RU08-06	YAMA RIVER	OKSA RIVER	FED FRY	1020000	1:1.1,2,2,3,2	1,2,2H	I I I I I	
RU08-07	YANA RIVER	YANA RIVER	FED FRY	2981000	1:1.1,2,5	1,5H	I I I I I I	
RU08-08	CHUKCHA RIVER	TAUY RIVER	FED FRY	117000	1:1.1,2,2	1,2H	I I I	
RU08-09	TIKHAE LAKE	TIKHAE LAKE	FED FRY	10651000	1:1.4,2,2	4,2H	I I I I I I	
RU08-10	PARATUNKA RIVER	PARATUNKA RIVER	FED FRY	8404300	2:1.4,2,3n	H4,3n		I I I I III
RU08-11	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	5230871	1:1.3,2,4	3,4H	I I I I I I I	
RU08-12	BOL'SHAYA RIVER	PLOTNIKOVA RIVER	FED FRY	1594189	1:1.3,2,1,3,2n	3,1,2nH	I I I I II	
RU08-13	BUYUKLINKA RIVER	BUYUKLINKA RIVER	FED FRY	16500000	1:1.3n,2,3	3n,3H	III I I I	
RU08-14	ZAVETINKA RIVER	ZAVETINKA RIVER	FED FRY	16090000	2:1.3,2,2	H3,2		I I I I I
RU08-15	KURILKA RIVER	KURILKA RIVER	FED FRY	2299100	1:1.3n,2,1,3,2n	3n,1,2nH	III I I I	
RU08-16	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	23891500	2:1.1,2,2,3,2	H1,2,2		I I I I I
RU08-17	PARATUNKA RIVER	PARATUNKA RIVER	FED FRY	830787	1:1.6	6H	I I I I I I I	
RU08-18	BOL'SHOY VILUY LAKE	BOL'SHOY VILUY LAKE	FED FRY	449207	1:1.3,2,1,3,1	3,1,1H	I I I I I	
RU07-24	YAMA RIVER	SHIROKAYA RIVER	FED FRY	38963	1:1.5	5H	I I I I I	
RU07-25	YANA RIVER	YANA RIVER	FED FRY	521776	1:1.3n-2,3n	3n-3nH	III III	
RU07-26	YANA RIVER	TAUY RIVER	FED FRY	359000	1:1.7	7H	I I I I I I I	
RU07-27	MAK-MAK LAKE	SHIROKAYA RIVER	FED FRY	23835	1:1.4,2,3H	4,3H	I I I I I I I	
RU08-19	BOL'SHAYA RIVER	KLYUCHYEVKA RIVER	FED FRY	574350	1:1.3,2,6	3,6H	I I I I I I I I I	
RU08-20	BOL'SHAYA RIVER	PLOTNIKOVA RIVER	FED FRY	2536321	1:1.3,2,1,3,3	3,1,3H	I I I I I I I	
RU08-21	BOL'SHAYA RIVER	PLOTNIKOVA RIVER	FED FRY	6760807	1:1.3,2,1,3,2n	3,1,2nH	I I I I II	
RU08-22	BOL'SHAYA RIVER	KLYUCHYEVKA RIVER	FED FRY	784035	2:1.3,2,5	H3,5		I I I I I I I I
RU08-23	BYSTRAYA RIVER	BYSTRAYA RIVER	FED FRY	32500000	1:1.3,2,2	3,2H	I I I I I	
RU08-24	BELAYA RIVER	BELAYA RIVER	FED FRY	133900	2:1.1,2,3	H1,3		I I I I I
RU08-25	FIRSOVKA RIVER	BELAYA RIVER	FED FRY	4593500	2:1.1,2,3	H1,3		I I I I I
RU08-26	FIRSOVKA RIVER	BELAYA RIVER	FED FRY	4059800	1:1.1,2,3+3,1,4,3	1,3H1,3	I I I I I	I I I I I
RU08-27	TARANAY RIVER	TARANAY RIVER	FED FRY	11646000	2:1.5	H5		I I I I I
RU08-28	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	2229000	1:1.3,2,1	3,1H	I I I I	
RU08-29	KURILKA RIVER	KURILKA RIVER	FED FRY	7321500	1:1.3n,2,1,3,2n	3n,1,2nH	III I I I	
RU08-30	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	41646100	2:1.1,2,2,3,2	H1,2,2		I I I I I
RU08-31	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	592600	1:1.1,2,2n,3,2n+4,1,5,2,6,2	1,2n,2nH1,2,2	I I I I I	I I I I I

ID#	MARK SCHEDULE
1	17
RU08-01	(5X)24D:24W
RU08-02	(1X)24D:48W,(1X)24D:24W,(2X)24D:48W
RU08-03	(1X)24D:48W,(2X)24D:24W,(2X)24D:48W
RU08-04	(1X)24D:48W,(1X)24D:24W,(1X)24D:48W,(2X)24D:24W
RU08-05	(1X)24D:48W,(1X)24D:24W,(1X)24D:48W,(2X)24D:24W
RU08-06	(1X)24D:48W,(1X)24D:24W,(1X)24D:48W,(2X)24D:24W
RU08-07	(1X)24D:48W,(5X)24D:24W
RU08-08	(1X)24D:48W,(2X)24D:24W
RU08-09	(3X)24D:24W,(1X)24D:48W,(2X)24D:24W
RU08-10	(3X)24H:24C,(1X)24H:48C,(3X)12H:12C
RU08-11	(2X)24D:24W,(1X)24D:48W,(4X)24D:24W
RU08-12	(2X)24D:24W,(2X)24D:48W,(2X)12D:12W
RU08-13	(2X)12D:12W,(1X)12D:24W,(3X)24D:24W
RU08-14	(2X)24H:24C,(1X)24H:48C,(2X)24H:24C
RU08-15	(2X)12D:12W,(1X)12D:24W,(1X)24D:24W,(2X)12D:12W
RU08-16	(1X)24C:48H,(1X)24C:24H,(1X)24C:48H,(2X)24C:24H
RU08-17	(6X)24H:24C
RU08-18	(2X)24D:24W,(2X)24D:48W
RU07-24	(5X)24D:24W
RU07-25	(2X)12D:12W,(1X)12D:72W,(3X)12D:12W
RU07-26	(7X)24D:24W
RU07-27	(3X)24D:24W,(1X)24D:48W,(3X)24D:24W
RU08-19	(2X)24C:24H,(1X)24C:48H,(6X)24C:24H
RU08-20	(2X)24D:24W,(2X)24D:48W,(3X)24D:24W
RU08-21	(2X)24D:24W,(2X)24D:48W,(2X)12D:12W
RU08-22	(2X)24C:24H,(1X)24C:48H,(5X)24C:24H
RU08-23	(2X)24D:24W,(1X)24D:48W,(2X)24D:24W
RU08-24	(1X)24H:48C,(3X)24H:24C
RU08-25	(1X)24H:48C,(3X)24H:24C
RU08-26	(1X)24D:48W,(3X)24D:24W+(1X)24H:48C,(3X)24H:24C
RU08-27	(5X)24H:24C
RU08-28	(2X)24D:24W,(2X)24D:48W
RU08-29	(2X)12D:12W,(1X)12D:24W,(1X)24D:24W,(2X)12D:12W
RU08-30	(1X)24H:48C,(1X)24H:24C,(1X)24H:48C,(2X)24H:24C
RU08-31	(1X)24D:48W,(1X)12D:12W,(1X)12D:48W,(2X)12D:12W + (1X)24H:48C,(1X)24H:24C,(1X)24H:48C,(2X)24H:24C