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Marked salmon production by the hatcheries of Russia in 2011

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 has been considerably increased during the last years, due to the mass marking in Sakhalin-Kurile region, the place where a lot of hatcheries of Russia are located.

The release of marked juvenile salmon by Russian hatcheries in 2011

Approximately 520 million marked juvenile salmons have been released by the hatcheries of Far East in 2011. In total, the salmon marking has been carried out at 26 hatcheries of Russia, including the 14 hatcheries of Sakhalin-Kurile region, 5 hatcheries of Kamchatka, 4 hatcheries of Magadan, 3 hatcheries of Khabarovsk region.

The major part of the released marked juveniles is Chum salmon – 326,1 million fishes (the increase is 12% comparing with 2010) and Pink salmon – 175,6 million fishes (the increase is 10% comparing with 2010) (see tab.1, fig.1)

Table 1. Marked juvenile salmon production by the hatcheries of Russia in 2011

State/ province	NUMBER OF RELEASED, mln. species.						% from total amount
	Chum	Coho	Chinook	Sockeye	Pink	All species	
Magadan	5.54	0.00	0.00	0.00	0.00	5.54	1.06
Khabarovsk	17.14	0.00	0.00	0.00	0.00	17.14	3.30
Kamchatka	29.00	0.86	0.81	16.22	0.00	46.89	9.03
Sakhalin	201.05	0.00	0.00	0.00	59.38	260.43	50.12
Iturup	73.40	0.00	0.00	0.00	116.19	189.59	36.49
Total	326.13	0.86	0.81	16.22	175.57	519.61	100.0
% from total	62.77	0.16	0.15	3.13	33.79	100.0	

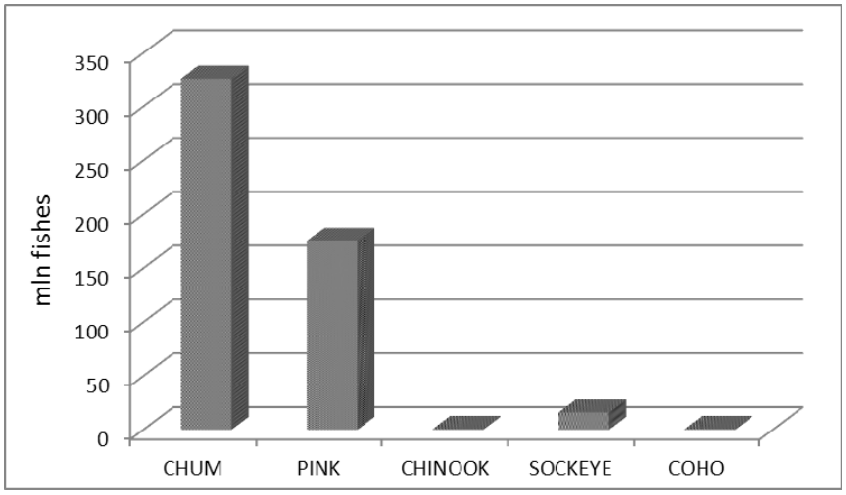

Fig.1. The marked juvenile salmon released by hatcheries of Far East

Sockeye salmon is 3,13%, Coho salmon is 0,16 % and Chinook salmon is 0,15% from the total mass of marked juveniles. The considerable amount of marked juveniles (over 86%) has been released by hatcheries of Sakhalin-Kurile region. The average amount of marked Chum salmon is 62 and 22% in Sakhalin-Kurile region (see fig. 2).

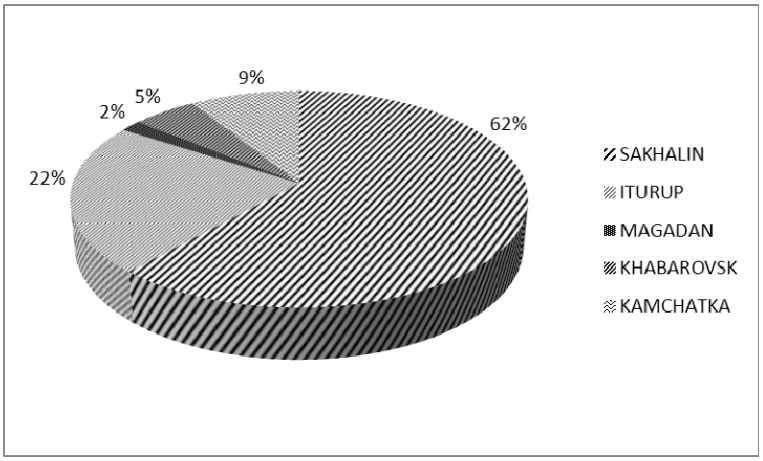

Fig. 2. The marked juvenile Chum salmon

The total mass of marked Pink salmon has been released by hatcheries of Sakhalin-Kurile region (see fig. 3).

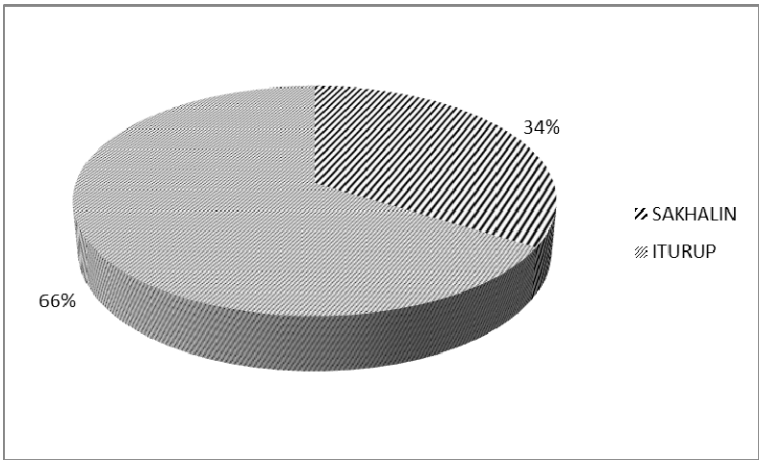

Fig. 3. The marked juvenile Pink salmon

The 30 unique marks were used for marking. There are 25 marks for Chum salmon, 2 marks for Coho salmon, 6 marks for Pink salmon, 1 mark for Chinook salmon. In the case when it was possible, the same mark was used for all rearing salmon species at the same hatchery.

The data, characterizing the marked juvenile brood of 2010, showed 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.

Hagen, P., H. J. Geiger, E. C. Volk, and J. J. Grimm. 2000. Thermal mark patterns applied to salmon from Alaska, Washington and Oregon for brood year 1999 and some proposed marks for brood year 2000. (NPAFC Doc. 463 rev. 1) 8 p. Alaska Department of Fish and Game, Juneau, Alaska 99801-5526, USA.

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 2011

ID#	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	AGENCY	FACILITY
1	2	3	4	5	6	7	8	9
RU10-01	DM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ADO-TYMOVSKY HATCHERY
RU10-02	TM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BEREZNYAKOVSKY HATCHERY
RU10-03	TM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BEREZNYAKOVSKY HATCHERY
RU10-04	DM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	BUYUKLOVSKY HATCHERY
RU10-05	DM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	KALININSKY HATCHERY
RU10-06	DM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	POBEDINSKY HATCHERY
RU10-07	DM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOLOVSKY HATCHERY
RU10-08	DM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	SOKOL`NIKOVSKY HATCHERY
RU10-09	TM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	TARANAYSKY HATCHERY
RU10-10	DM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU10-11	DM	2010	2011	CHUM	RUSSIA	SAKHALIN	SAKHALINRYBVOD	YASNOMORSKY HATCHERY
RU10-12	DM	2010	2011	CHUM	RUSSIA	ITURUP	GIDROSTROY	BUHTA OLYA HATCHERY
RU10-13	DM	2010	2011	CHUM	RUSSIA	ITURUP	GIDROSTROY	BUHTA OLYA HATCHERY
RU10-14	DM	2010	2011	CHUM	RUSSIA	ITURUP	GIDROSTROY	KURIL`SKY HATCHERY
RU10-15	TM	2010	2011	CHUM	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU10-16	DM	2010	2011	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	ARMANSKY HATCHERY
RU10-17	DM	2010	2011	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	OL`SKY HATCHERY
RU10-18	DM	2010	2011	CHUM	RUSSIA	MAGADAN	MAGADANNIRO	OL`SKY HATCHERY
RU10-19	DM	2010	2011	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	TAUYSKY HATCHERY
RU10-20	DM	2010	2011	CHUM	RUSSIA	MAGADAN	OKHOTSKRYBVOD	YANSKY HATCHERY
RU10-21	DM	2010	2011	CHUM	RUSSIA	KHABAROVSK	AMURRYBVOD	ANUYSKY HATCHERY
RU10-22	DM	2010	2011	CHUM	RUSSIA	KHABAROVSK	AMURRYBVOD	GURSKY HATCHERY
RU10-23	DM	2010	2011	CHUM	RUSSIA	KHABAROVSK	OOO "KOMETA"	KOMETA HATCHERY
RU10-24	DM	2010	2011	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	KETKINSKY HATCHERY
RU10-25	DM	2010	2011	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	OZERKOVSKY HATCHERY
RU10-26	TM	2010	2011	CHUM	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	PARATUNSKY HATCHERY
RU10-27	DM	2010	2011	PINK	RUSSIA	SAKHALIN	SAKHALINRYBVOD	ANIVSKY HATCHERY
RU10-28	DM	2010	2011	PINK	RUSSIA	SAKHALIN	SAKHALINRYBVOD	TARANAYSKY HATCHERY
RU10-29	DM	2010	2011	PINK	RUSSIA	SAKHALIN	SAKHALINRYBVOD	UROZHAYNYY HATCHERY
RU10-30	DM	2010	2011	PINK	RUSSIA	ITURUP	GIDROSTROY	KURIL`SKY HATCHERY
RU10-31	TM	2010	2011	PINK	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU10-32	TM	2010	2011	PINK	RUSSIA	ITURUP	GIDROSTROY	REYDOVYY HATCHERY
RU10-33	TM	2010	2011	CHINOOK	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	MALKINSKY HATCHERY
RU10-34	TM	2010	2011	SOCKEYE	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	MALKINSKY HATCHERY
RU10-35	DM	2010	2011	SOCKEYE	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	OZERKOVSKY HATCHERY
RU10-36	TM	2010	2011	COHO	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	PARATUNSKY HATCHERY
RU10-37	DM	2009	2011	COHO	RUSSIA	KAMCHATKA	FGU DIREKCIA LRZ	VILYUYSKY HATCHERY

Table 2 (Continuation). Marked salmon production by the hatcheries of Russia in 2011

ID#	STOCK	FINAL RELEASE SITE	STAGE	NUMBER OF RELEASED	RBr	HATCH CODE
1	10	11	12	13	14	15
RU10-01	TYM' RIVER	TYM' RIVER	FED FRY	26965500	1:1.1,2.5	1,5H
RU10-02	BOL'SHOY TAKOY RIVER	BOL'SHOY TAKOY RIVER	FED FRY	18385600	2:1.1,2.2,3.2,4.1	H1,2,2,1
RU10-03	BOL'SHOY TAKOY RIVER	BOL'SHOY TAKOY RIVER	FED FRY	9510000	1:1.3+2.1,3.2,4.2,5.1	3H1,2,2,1
RU10-04	BUYUKLINKA RIVER	BUYUKLINKA RIVER	FED FRY	35044000	1:1.8	8H
RU10-05	KALINKA RIVER	KALINKA RIVER	FED FRY	34700000	1:1.3n,2.3n	3n,3nH
RU10-06	PORONAY RIVER	PORONAY RIVER	FED FRY	13550400	1:1.1,2.4n,3.1	1,4n,1H
RU10-07	BUYUKLINKA RIVER	BELAYA RIVER	FED FRY	9205000	1:1.5,2.2	5,2H
RU10-08	ZAVETINKA RIVER	ZAVETINKA RIVER	FED FRY	15466000	1:1.3n,2.3	3n,3H
RU10-09	TARANAY RIVER	TARANAY RIVER	FED FRY	19845500	2:1.1,2.4	H1,4
RU10-10	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	5841100	1:1.3,2.3n	3,3nH
RU10-11	YASNOMORKA RIVER	YASNOMORKA RIVER	FED FRY	12538300	1:1.3,2.3	3,3H
RU10-12	KURILKA RIVER	OLYA BAY	FED FRY	6436000	1:1.4	4H
RU10-13	REYDOVAYA RIVER	OLYA BAY	FED FRY	19772900	1:1.4	4H
RU10-14	KURILKA RIVER	KURILKA RIVER	FED FRY	20640800	1:1.3,2.4	3,4H
RU10-15	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	26555581	2:1.4,2.2	H4,2
RU10-16	GLUKHOYE LAKE	GNILAYA RIVER	FED FRY	157000	1:1.1,2.3,3.1	1,3,1H
RU10-17	STARAYA VESELAYA RIVER	STARAYA VESELAYA BAY	FED FRY	1115949	1:1.5	5H
RU10-18	KUL`KUTY RIVER	KUL`KUTY RIVER	FED FRY	2933455	1:1.6	6H
RU10-19	YANA RIVER	TAUY RIVER	FED FRY	115000	1:1.1,2.2	1,2H
RU10-20	YANA RIVER	YANA RIVER	FED FRY	1220400	1:1.4,2.2n	4,2nH
RU10-21	ANYUY RIVER	ANYUY RIVER	FED FRY	12216000	1:1.3,2.1,3.2	3,1,2H
RU10-22	GUR RIVER	GUR RIVER	FED FRY	3873902	1:1.4n,2.2n	4n,2nH
RU10-23	TIKHOE LAKE	GYDZHU	FED FRY	1051000	1:1.7	7H
RU10-24	AVACHA RIVER	ZELENOVSKIY SPRING	FED FRY	10525617	1:1.3	3H
RU10-25	BOL`SHAYA RIVER	PLOTNIKOVA RIVER	FED FRY	3235841	1:1.3,2.2,3.2	3,2,2H
RU10-26	PARATUNKA RIVER	TREZUBETC SPRING	FED FRY	15237600	2:1.6	H6
RU10-27	BYSTRAYA RIVER	BYSTRAYA RIVER	FED FRY	33026600	1:1.4,2.3	4,3H
RU10-28	TARANAY RIVER	TARANAY RIVER	FED FRY	15577000	1:1.1,2.4	1,4H
RU10-29	CHERNAYA RIVER	CHERNAYA RIVER	FED FRY	10780000	1:1.3,2.3n	3,3nH
RU10-30	KURILKA RIVER	KURILKA RIVER	FED FRY	73335100	1:1.3,2.4	3,4H
RU10-31	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	21374296	1:1.4+2.4,3.2	4H4,2
RU10-32	REYDOVAYA RIVER	REYDOVAYA RIVER	FED FRY	21482118	2:1.4,2.2	H4,2
RU10-33	BOL`SHAYA RIVER	KLYUCHYEVKA RIVER	FED FRY	814541	2:1.3,2.1	H3,1
RU10-34	BOL`SHAYA RIVER	KLYUCHYEVKA RIVER	FED FRY	612467	1:1.3,2.1	3,1H
RU10-35	BOL`SHAYA RIVER	PLOTNIKOVA RIVER	FED FRY	15608528	1:1.3,2.2,3.2	3,2,2H
RU10-36	PARATUNKA RIVER	TREZUBETC SPRING	FED FRY	380000	2:1.6	H6
RU10-37	BOL`SHOY VILYUY LAKE	BOL`SHOY VILYUY LAKE	FED FRY	483180	1:1.3,2.1	3,1H