

## Marked Salmon Production by the Hatcheries of Russia in 2015

by

Elena Akinicheva<sup>1</sup>, Vladimir Volobuev<sup>2</sup>, Evgeny Fomin<sup>2</sup>, and Maksim Myakishev<sup>3</sup>

<sup>1</sup>Sakhalin Research Institute of Fisheries and Oceanography  
196, Komsomolskaya St., Yuzhno-Sakhalinsk 693023, Russia

<sup>2</sup>Magadan Research Institute of Fisheries and Oceanography  
36/10 Portovaya St., Magadan 685000, Russia

<sup>3</sup>Sakhalin Basin Department for Fisheries and Conservation of Water Biological Resources  
43-A, Yemelyanova St., Yuzhno-Sakhalinsk 693006, Russia

Submitted to the

**NORTH PACIFIC ANADROMOUS FISH COMMISSION**

by

Russia

March 2016

**THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:**

Akinicheva, E., V. Volobuev, E. Fomin, and M. Myakishev. 2016. Marked salmon production by the hatcheries of Russia in 2015. NPAFC Doc. 1630. 4 pp. Sakhalin Research Institute of Fisheries and Oceanography, Magadan Research Institute of Fisheries and Oceanography, and Sakhalin Basin Department for Fisheries and Conservation of Water Biological Resources (Available at <http://www.npafc.org>).

**Keywords:** otolith marks, Russia, salmon, hatcheries

### Abstract

In Russia, hatcheries salmon marking, as in previous years, is directed at evaluating of number of hatchery-raised salmon returns. These researches are combined with research of migrations and distribution of young salmon in coastal and extrajurisdictional waters.

The marking at hatcheries is conducted by two methods: thermal (Munk et al., 1993) and “dry” (Safronenkov et al., 1999).

The hatcheries are located basically on Sakhalin and Kuriles, therefore here there is the greatest number of releases of the marked young salmon (about 89,7 % in 2015).

### Marked salmon production by the hatcheries of Russia in 2015

In 2015 Russian hatcheries released 545,6 million of marked juveniles. The major part of marked juvenile salmon are Chum salmon – 368,2 million (67,5%) and Pink salmon – 168,0 million (30,8%) from the total amount of marked salmon. The share of other species (Sockeye, Chinook, Coho and Masu) did not exceed 1,8%. Sockeye were released 4,6 million, Coho – 3,9 million, Chinook – 0,9 million, Masu – 0,06 million (Table 1).

Table 1

### Release of marked Pacific salmon at the hatcheries of the Far East

Species/ province	NUMBER OF RELEASED, mln						Share,%
	Magadan	Kamchatka	Sakhalin	Iturup	Khabarovsk	Total	
Chum	6,2	28,3	249,7	78,3	5,7	368,2	67,5
Pink	1,8	0	134,7	26,7	4,7	168,0	30,8
Coho	2,8	1,1	0	0	0	3,9	0,7
Sockeye	0	4,6	0	0	0	4,6	0,8
Chinook	0	0,9	0	0	0	0,9	0,2
Masu	0	0	0	0	0,06	0,06	0,01
Total	10,8	34,9	384,4	105,0	10,4	545,6	100

The most part of marked juveniles was released from the hatcheries of Sakhalin (384,4 million) and Iturup Island (105,0 million). In Magadan region there was 10,8 million, Kamchatka – 34,9 million, in Khabarovsk region – 10,4 million. In Magadan juveniles was marked at three hatcheries, in Kamchatka – at five hatcheries, in Khabarovsk region at two hatcheries, in Sakhalin at sixteen hatcheries and in Iturup Island at four hatcheries.

All together 33 different mark patterns were used for marking. 29 of which were used for Chum salmon: 5 mark patterns were used in Magadan, 3 of them in Kamchatka, in Khabarovsk – 2, in Sakhalin – 14, in Iturup – 5.

For marking of Pink salmon 11 marks were used, 3 of which in Magadan, in Sakhalin – 6, in Iturup – 1, in Khabarovsk – 1.

Marked juvenile Coho was released in Magadan region and Kamchatka. Juveniles were released at the age of fingerlings and one-yearlings. Three marks were used for fingerlings and two for one-yearlings which were marked in 2013.

Sockeye and Chinook were marked at hatcheries of Kamchatka. Two marks were used for Sockeye and one – for Chinook salmon.

Marked juvenile Masu salmon was released in Khabarovsk region. One mark was used for Masu salmon.

As well as during the previous years, the most part of the salmon (83,7%) was marked by “dry” method before hatching of embryos.

Data on release of the marked salmon are represented in the Table 2. The hatch code notations were used to describe thermal patterns (Hagen et al., 2000; Johnson et al., 2006).

### **References**

Hagen, P., H. J. Geiger, E. Volk, and 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) Alaska Department of Fish and Game, Juneau, Alaska 99801-5526, USA. – 8 p.

Johnson, W.F., R.P. Josephson, T.R. Frawley, and D.S. Oxman. 2006. Revised web-based north pacific salmon otolith mark directory // (NPAFC Doc. 971). Alaska Dept. Fish and Game, Juneau Alaska. – 39 p.

Munk K.M., Smoker W.W., Beard D.R., Mattson R.W. 1993. A hatchery water heating system and its application to 100% thermal marking salmon // Progress. Fish Culturist 3. – P. 284 –288.

Safronenkov B., Akinicheva E., Rogatnykh A. 1999. The dry method of salmon otolith mass marking // Abstr. Intern. Sympos. "Recent Changes in Ocean Production of Pacific Salmon", Juneau. – P. 81–82.

Table 2. Releases of otolith marked salmon from Russia in 2015

ID#	MARK TYPE	BROOD YEAR	SPECIES	COUNTRY	STATE/ PROVINCE	FACILITY	FINAL RELEASE SITE	NUMBER OF RELEASED	HATCH CODE	DATE LAST RELEASED
1	2	3	4	5	6	7	9	10	11	12
RU14-01	DM	2014	CHUM	RUSSIA	MAGADAN	ARMANSKY HATCHERY	ARMAN RIVER	1394100	5H	06/11/2015
RU14-02	DM	2014	CHUM	RUSSIA	MAGADAN	ARMANSKY HATCHERY	OKSA RIVER	366680	5H	06/11/2015
RU14-03	DM	2014	CHUM	RUSSIA	MAGADAN	OL'SKY HATCHERY	OLYA RIVER	629780	3n,3H	06/02/2015
RU14-04	DM	2014	CHUM	RUSSIA	MAGADAN	OL'SKY HATCHERY	OLYA RIVER	1622520	5,3nH	06/02/2015
RU14-05	DM	2014	CHUM	RUSSIA	MAGADAN	OL'SKY HATCHERY	KUL' KUTY RIVER	1460000	1,3,1H	17.07.2015
RU14-06	DM	2014	CHUM	RUSSIA	MAGADAN	YANSKY HATCHERY	YANA RIVER	705000	1,2,1H	05.06.2015
RU14-07	DM	2014	CHUM	RUSSIA	KAMCHATKA	KETKINSKY HATCHERY	AVACHA RIVER	6832299	7H	25.06.2015
RU14-08	DM	2014	CHUM	RUSSIA	KAMCHATKA	OZERKOVSKY HATCHERY	BOL' SHAYA RIVER	1828595	3,2H	14.05.2015
RU14-09	TM	2014	CHUM	RUSSIA	KAMCHATKA	PARATUNSKY HATCHERY	PARATUNKA RIVER	19671224	H3,4	18.05.2015
RU14-10	DM	2014	CHUM	RUSSIA	SAKHALIN	ADO-TYMOVSKY HATCHERY	TYM' RIVER	17903050	3H3,2	13.07.2015
RU14-11	DM	2014	CHUM	RUSSIA	SAKHALIN	ADO-TYMOVSKY HATCHERY	TYM' RIVER	15092758	3H3,2	13.07.2015
RU14-12	DM	2014	CHUM	RUSSIA	SAKHALIN	POBEDINSKY HATCHERY	PORONAY RIVER	18428031	5,1H	05.07.2015
RU14-13	DM	2014	CHUM	RUSSIA	SAKHALIN	BUYUKLOVSKY HATCHERY	BUYUKLINKA RIVER	41525000	1,5H	09.07.2015
RU14-14	TM	2014	CHUM	RUSSIA	SAKHALIN	SOKOLOVSKY HATCHERY	NAYBA RIVER	10522391	H3,2,2	14.07.2015
RU14-15	TM	2014	CHUM	RUSSIA	SAKHALIN	SOKOLOVSKY HATCHERY	NAYBA RIVER	4537701	H3,2,2	27.07.2015
RU14-16	TM	2014	CHUM	RUSSIA	SAKHALIN	SOKOLOVSKY HATCHERY	NAYBA RIVER	3248300	H3,2,2	27.07.2015
RU14-17	TM	2014	CHUM	RUSSIA	SAKHALIN	BEREZNYAKOVSKY HATCHERY	BOL' SHOY TAKOY RIVER	4520300	H4,4	26.06.2015
RU14-18	TM	2014	CHUM	RUSSIA	SAKHALIN	BEREZNYAKOVSKY HATCHERY	BOL' SHOY TAKOY RIVER	5273500	H4,4	26.06.2015
RU14-19	TM	2014	CHUM	RUSSIA	SAKHALIN	BEREZNYAKOVSKY HATCHERY	BOL' SHOY TAKOY RIVER	1975100	H4,4	29.06.2015
RU14-20	TM	2014	CHUM	RUSSIA	SAKHALIN	BEREZNYAKOVSKY HATCHERY	BOL' SHOY TAKOY RIVER	8099100	H4,4	10.07.2015
RU14-21	DM	2014	CHUM	RUSSIA	SAKHALIN	TARANAYSKY HATCHERY	TARANAY RIVER	11924625	4,2H	20.06.2015
RU14-22	DM	2014	CHUM	RUSSIA	SAKHALIN	YASNOMORSKY HATCHERY	YASNOMORKA RIVER	9200900	3n,2,1H	15.06.2015
RU14-23	DM	2014	CHUM	RUSSIA	SAKHALIN	SOKOL'NIKOVSKY HATCHERY	ZAVETINKA RIVER	15572000	3n,1,3H	19.06.2015
RU14-24	DM	2014	CHUM	RUSSIA	SAKHALIN	KALININSKY HATCHERY	KALINKA RIVER	36060000	3n,1,2nH	09.06.2015
RU14-25	DM	2014	CHUM	RUSSIA	SAKHALIN	UROZHAYNYY HATCHERY	CHERNAYA RIVER	528000	6nH	22.06.2015
RU14-26	DM	2014	CHUM	RUSSIA	SAKHALIN	UROZHAYNYY HATCHERY	CHERNAYA RIVER	8607200	6nH	25.06.2015
RU14-27	DM	2014	CHUM	RUSSIA	SAKHALIN	BAKHURA HATCHERY	BAKHURA RIVER	505900	4,2nH	26.06.2015
RU14-28	DM	2014	CHUM	RUSSIA	SAKHALIN	MONETKA HATCHERY	OSTROVKA RIVER	4672800	3n,1,2H	12.06.2015
RU14-29	DM	2014	CHUM	RUSSIA	SAKHALIN	OHOTSKY HATCHERY	UDARNITSA RIVER	21418300	6H	18.06.2015
RU14-30	DM	2014	CHUM	RUSSIA	SAKHALIN	LESNOY HATCHERY	OCHEPUKHA RIVER	10047500	3n,4H	27.06.2015
RU14-31	DM	2014	CHUM	RUSSIA	ITURUP	KURIL'SKY HATCHERY	KURILKA RIVER	9352500	3,4H	27.06.2015

Table 2 (continued). Releases of otolith marked salmon from Russia in 2015

ID#	MARK TYPE	BROOD YEAR	SPECIES	COUNTRY	STATE/ PROVINCE	FACILITY	FINAL RELEASE SITE	NUMBER OF RELEASED	HATCH CODE	DATE LAST RELEASED
1	2	3	4	5	6	7	9	10	11	12
RU14-32	TM	2014	CHUM	RUSSIA	ITURUP	REYDOVYY HATCHERY	REYDOVAYA RIVER	24312000	H1,2,2	27.06.2015
RU14-33	TM	2014	CHUM	RUSSIA	ITURUP	REYDOVYY HATCHERY	REYDOVAYA RIVER	4200000	1,2,2H	22.06.2015
RU14-34	DM	2014	CHUM	RUSSIA	ITURUP	HATCHERY ON BAY OLYA	OLYA RIVER	18758400	3,3H	15.06.2015
RU14-35	DM	2014	CHUM	RUSSIA	ITURUP	KITOVYY HATCHERY	KITOVAYA RIVER	21691000	7nH	01.07.2015
RU14-36	TM	2014	CHUM	RUSSIA	KHABAROVSK	KOMETA HATCHERY	GYDZHU RIVER	315000	3-3H	25.06.2015
RU14-37	DM	2014	CHUM	RUSSIA	KHABAROVSK	ANYUYSKY HATCHERY	ANYUY RIVER	5366502	1,4nH	21.04.2015
RU14-38	DM	2014	PINK	RUSSIA	MAGADAN	ARMANSKY HATCHERY	ARMAN RIVER	475000	1,5H	04.06.2015
RU14-39	DM	2014	PINK	RUSSIA	MAGADAN	OL`SKY HATCHERY	UGLIKANKA RIVER	390000	3,2nH	02.06.2015
RU14-40	DM	2014	PINK	RUSSIA	MAGADAN	YANSKY HATCHERY	YANA RIVER	957000	1,2,1H	04.06.2015
RU14-41	DM	2014	PINK	RUSSIA	SAKHALIN	ANIVSKY HATCHERY	BYSTRAYA RIVER	36987000	3,2H	08.06.2015
RU14-42	DM	2014	PINK	RUSSIA	SAKHALIN	TARANAYSKY HATCHERY	TARANAY RIVER	19045700	7H	07.06.2015
RU14-43	DM	2014	PINK	RUSSIA	SAKHALIN	UROZHAYNYY HATCHERY	CHERNAYA RIVER	6862200	5nH	28.05.2015
RU14-44	DM	2014	PINK	RUSSIA	SAKHALIN	BAKHURA HATCHERY	BAKHURA RIVER	11652200	3n,4H	15.06.2015
RU14-45	DM	2014	PINK	RUSSIA	SAKHALIN	IGRIVAYA HATCHERY	IGRIVAYA RIVER	4869700	5H	31.05.2015
RU14-46	DM	2014	PINK	RUSSIA	SAKHALIN	MONETKA HATCHERY	OSTROVKA RIVER	24371900	5H	11.06.2015
RU14-47	DM	2014	PINK	RUSSIA	SAKHALIN	MONETKA HATCHERY	CHIRKOVA RIVER	4584700	5H	02.06.2015
RU14-48	DM	2014	PINK	RUSSIA	SAKHALIN	LESNOY HATCHERY	OCHEPUKHA RIVER	26381300	1,4H	19.06.2015
RU14-49	DM	2014	PINK	RUSSIA	ITURUP	KURIL`SKY HATCHERY	KURILKA RIVER	26751900	5,1H	27.06.2015
RU14-50	DM	2014	PINK	RUSSIA	KHABAROVSK	KOMETA HATCHERY	GYDZHU RIVER	4685000	3n,3H	25.05.2015
RU14-51	DM	2014	COHO	RUSSIA	MAGADAN	OL`SKY HATCHERY	UGLIKANKA RIVER	947000	5H	17.09.2015
RU14-52	DM	2014	COHO	RUSSIA	MAGADAN	YANSKY HATCHERY	YANA RIVER	777300	1,2,1H	18.09.2015
RU14-53	TM	2014	COHO	RUSSIA	KAMCHATKA	PARATUNSKY HATCHERY	PARATUNKA RIVER	602500	H3,4	07.07.2015
RU14-54	DM	2014	SOCKEYE	RUSSIA	KAMCHATKA	OZERKOVSKY HATCHERY	BOL`SHAYA RIVER	4026075	3,3H	06.07.2015
RU14-55	TM	2014	SOCKEYE	RUSSIA	KAMCHATKA	MALKINSKY HATCHERY	BOL`SHAYA RIVER	583486	3,1H	12.05.2015
RU14-56	TM	2014	CHINOOK	RUSSIA	KAMCHATKA	MALKINSKY HATCHERY	BOL`SHAYA RIVER	894130	H4	07.05.2015
RU13-60	DM	2013	COHO	RUSSIA	MAGADAN	OL`SKY HATCHERY	TANON RIVER	1040000	6nH	02.06.2015
RU13-61	DM	2013	COHO	RUSSIA	KAMCHATKA	VILYUYSKY HATCHERY	BOL`SHOY VILYUY LAKE	522590	5,1H	18.06.2015
RU13-62	DM	2013	MASU	RUSSIA	KHABAROVSK	KOMETA HATCHERY	GYDZHU RIVER	59000	5H	25.07.2015