

Proposed Otolith Marks for Brood Year 2020 Salmon in Russia

by

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Abstract

Mass-marking of juvenile pacific salmon is an effective instrument of salmon origin identification at every stage of their life cycle. In Russia, otolith marking is being used to obtain data on the proportion of fish raised in hatcheries in their return to rivers. The presence of marks on otoliths allows an identification of salmon raised in different hatcheries, which is important information for fish farming. Moreover, research in Russia into the differentiation between hatchery-raised and wild stock at the early stages of their sea life allows to understand distribution, movement and abundance of juvenile salmon at sea, along with the identification of salmon from different reproductive zones. The finding of marked salmon during their ocean feeding period allows us to determine their area of distribution and learn more about migration of wild salmon.

The plan of salmon marking for brood 2020 at Russian hatcheries

The marking of salmon generation 2020 in Russia will be conducted in 5 regions of the Russian Far East: Kamchatka, Magadan, and Sakhalin Regions, Khabarovsk Krai and Primorski Krai. We shall use 2 marking methods: thermal and 'dry' (Munk et al., 1993, Safronenkov et al., 1999). Since most hatcheries don't have a possibility for thermal marking, the dominant method will be the 'dry' one.

Juvenile salmon of generation 2020 will be marked at 41 Far Eastern hatcheries: 19—on Sakhalin Island, 12—on Iturup Island, 5—on Kamchatka Peninsula, 3—in Magadan, 1—in Khabarovsk Krai, and 1—in Primorski Krai. In 2020, there will be 37 marks used for marking chum salmon, 13 marks for pink, 5 marks for coho, 2 marks for sockeye, and 1 mark for chinook. In some cases, the same mark will be used for different species of salmon. Forty-seven unique marks will be used altogether.

Russian plan for marking of salmon brood 2020 is shown in Table 1. Mark patterns are presented in the Uniform Hatch Code notation (Johnson et al. 2006).

References

- 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.
- 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). 39 p. Alaska Dept. Fish and Game, Juneau Alaska

Table1. Plan marks from Russia for 2020 brood year stocks of salmon

MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	FACILITY	HATCH CODE	GRAPHIC IMAGE	
								PREHATCH	POSTHATCH
1	2	3	4	5	6	7	8	9	10
TM	2020	2021	CHUM	RUSSIA	SAKHALIN	ADO-TYMOVSKY HATCHERY	H4,2		IIII II
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	BUYUKLOVSKY HATCHERY	5,1H	IIIII I	
TM	2020	2021	CHUM	RUSSIA	SAKHALIN	POBEDINSKY HATCHERY	H6		IIIIII
TM	2020	2021	CHUM	RUSSIA	SAKHALIN	POBEDINSKY HATCHERY	6H	IIIIII	
TM	2020	2021	CHUM	RUSSIA	SAKHALIN	BEREZNYAKOVSKY HATCHERY	H5,2		IIIII II
TM	2020	2021	CHUM	RUSSIA	SAKHALIN	BEREZNYAKOVSKY HATCHERY	5,2H	IIIII II	
TM	2020	2021	CHUM	RUSSIA	SAKHALIN	SOKOLOVSKY HATCHERY	H3,3		III III
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	UROZHAYNYY HATCHERY	5nH	IIII	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	SOKOL'NIKOVSKY HATCHERY	7nH	IIIIII	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	KALININSKY HATCHERY	6nH	IIII	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	YASNOMORSKY HATCHERY	1,4nH	I III	
TM	2020	2021	CHUM	RUSSIA	SAKHALIN	TARANAYSKY HATCHERY	3,2nH	III II	
TM	2020	2021	CHUM	RUSSIA	SAKHALIN	TARANAYSKY HATCHERY	H3,2n		III II
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	LESNOY HATCHERY	4,2nH	IIII II	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	OKHOTSKY HATCHERY	8nH	IIIIII	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	MANUY HATCHERY	1,2n,2H	I II II	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	AY HATCHERY	3,4nH	III III	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	FIRSOVKA HATCHERY	3,5nH	III III	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	OL'KHOVATKA HATCHERY	1,5H	I IIIII	
DM	2020	2021	CHUM	RUSSIA	SAKHALIN	GASTELLO HATCHERY	3,2n,2H	III II II	
DM	2020	2021	CHUM	RUSSIA	ITURUP	LEBEDINYY HATCHERY	4nH	III	
DM	2020	2021	CHUM	RUSSIA	ITURUP	MINERAL'NYY HATCHERY	3n,3nH	III III	
DM	2020	2021	CHUM	RUSSIA	ITURUP	KURIL'SKY HATCHERY	3n,1,3H	III I III	
DM	2020	2021	CHUM	RUSSIA	ITURUP	KITOVYY	3,1H	III I	
TM	2020	2021	CHUM	RUSSIA	ITURUP	REYDOVYY HATCHERY	1,3,1H	I III I	
TM	2020	2021	CHUM	RUSSIA	ITURUP	REYDOVYY HATCHERY	H1,3,1		I III I
DM	2020	2021	CHUM	RUSSIA	ITURUP	BUKHTA OLYA HATCHERY	3,2H	III II	
DM	2020	2021	CHUM	RUSSIA	ITURUP	YANKITO HATCHERY	3H	III	
DM	2020	2021	CHUM	RUSSIA	ITURUP	KONSERVNYY HATCHERY	1,2H	I II	
DM	2020	2021	CHUM	RUSSIA	ITURUP	SKAL'NYY HATCHERY	1,2,1H	I II I	
DM	2020	2021	CHUM	RUSSIA	ITURUP	OZERO HATCHERY	1,5nH	I IIII	

Table 1 (continued). Plan marks from Russia for 2016 brood year stocks of salmon

MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	FACILITY	HATCH CODE	GRAPHIC IMAGE	
								PREHATCH	POSTHATCH
1	2	3	4	5	6	7	8	9	10
DM	2020	2021	CHUM	RUSSIA	ITURUP	SARATOVSKY HATCHERY	4n,2H	III I I	
DM	2020	2021	CHUM	RUSSIA	ITURUP	KUIBYSHEVSKY HATCHERY	3n,1H	III I	
DM	2020	2021	CHUM	RUSSIA	MAGADAN	ARMANSKY HATCHERY	3,3H	I I I I I I	
DM	2020	2021	CHUM	RUSSIA	MAGADAN	OL`SKY HATCHERY	5H	I I I I I	
DM	2020	2021	CHUM	RUSSIA	MAGADAN	YANSKY HATCHERY	4,1H	I I I I I	
TM	2020	2021	CHUM	RUSSIA	KAMCHATKA	PARATUNSKY HATCHERY	H3,3		I I I I I I
DM	2020	2021	CHUM	RUSSIA	KAMCHATKA	OZERKOVSKY HATCHERY	4,2H	I I I I I I	
DM	2020	2021	CHUM	RUSSIA	KAMCHATKA	KETKINSKY HATCHERY	3,4H	I I I I I I I I	
TM	2020	2021	CHUM	RUSSIA	KHABAROVSK	ANYUYSKY HATCHERY	3n,3H	III I I I	
TM	2020	2021	CHUM	RUSSIA	KHABAROVSK	ANYUYSKY HATCHERY	H3n,3		III I I I
DM	2020	2021	CHUM	RUSSIA	PRIMORSKY KRAI	RYAZANOVSKY HATCHERY	9nH	IIIIIIII	
DM	2020	2021	PINK	RUSSIA	SAKHALIN	ANIVSKY HATCHERY	3,2H	I I I I I	
TM	2020	2021	PINK	RUSSIA	SAKHALIN	TARANAYSKY HATCHERY	5H	I I I I I	
TM	2020	2021	PINK	RUSSIA	SAKHALIN	TARANAYSKY HATCHERY	H5		I I I I I
DM	2020	2021	PINK	RUSSIA	SAKHALIN	UROZHAYNYI HATCHERY	5n,2H	IIII I I	
DM	2020	2021	PINK	RUSSIA	SAKHALIN	LESNOY HATCHERY	3n,3H	III I I I	
DM	2020	2021	PINK	RUSSIA	SAKHALIN	MANUY HATCHERY	3n,4H	III I I I I	
DM	2020	2021	PINK	RUSSIA	SAKHALIN	PUGACHEVSKIY HATCHERY	1,4H	I I I I I	
DM	2020	2021	PINK	RUSSIA	ITURUP	KUIBYSHEVSKY HATCHERY	3n,1H	III I	
DM	2020	2021	PINK	RUSSIA	ITURUP	SARATOVSKY HATCHERY	4n,2H	III I I	
DM	2020	2021	PINK	RUSSIA	ITURUP	KURIL`SKY HATCHERY	3n,1,3H	III I I I I	
TM	2020	2021	PINK	RUSSIA	ITURUP	REYDOVYY HATCHERY	1,3,1H	I I I I I	
TM	2020	2021	PINK	RUSSIA	ITURUP	REYDOVYY HATCHERY	H1,3,1		I I I I I
DM	2020	2021	PINK	RUSSIA	MAGADAN	ARMANSKY HATCHERY	1,5H	I I I I I I	
DM	2020	2021	PINK	RUSSIA	MAGADAN	OL`SKY HATCHERY	4,2nH	I I I I I I	
DM	2020	2021	PINK	RUSSIA	MAGADAN	YANSKY HATCHERY	3,3nH	I I I I I I	
TM	2020	2021	COHO	RUSSIA	KAMCHATKA	PARATUNSKY HATCHERY	H5		I I I I I I
DM	2020	2021	COHO	RUSSIA	KAMCHATKA	VILUYSKY HATCHERY	3,1H	I I I I	
DM	2020	2021	COHO	RUSSIA	MAGADAN	ARMANSKY HATCHERY	1,2,1H	I I I I	
DM	2020	2021	COHO	RUSSIA	MAGADAN	OL`SKY HATCHERY	4,1H	I I I I I	
DM	2020	2021	COHO	RUSSIA	MAGADAN	YANSKY HATCHERY	3,4H	I I I I I I I I	
DM	2020	2021	SOCKEYE	RUSSIA	KAMCHATKA	OZERKOVSKY HATCHERY	3,4H	I I I I I I I I	
TM	2020	2021	SOCKEYE	RUSSIA	KAMCHATKA	MALKINSKY HATCHERY	3,2H	I I I I I	
TM	2020	2021	CHINOOK	RUSSIA	KAMCHATKA	MALKINSKY HATCHERY	H3,2		I I I I I