

Proposed Otolith Marks for Brood Year 2017 Salmon in Russia

by

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Abstract

Mass-marking of juvenile Pacific salmon is an effective tool for fish origin identification at all stages of their life. In Russia, otolith-marking is used to obtain information on proportion of hatchery-reared fish in their commercial returns. Occurrence of marks on otoliths makes it possible to identify salmon from different hatcheries that is the most important thing for fish farmers. Besides, in Russia the researches on differentiation of hatchery and wild stocks salmon during their early sea life period have been conducted. This allows receiving information on distribution, movements and abundance of young salmon in the sea, and identifying salmon from different reproductive zones (Kamchatka, Sakhalin, Magadan, and Khabarovsk regions). Finding of marked salmon during their ocean feeding period allow us to define areas of distribution and to know more about migrations of the wild salmon.

Keywords: otolith marking, method of marking, juvenile salmon, hatcheries, marks.

Mark Plan for Brood Year 2017 Pacific Salmon in Russia

The proposed otolith marks for the 2017 brood year salmon are given in Table 1. Otolith marking of salmon of 2017 brood year will be conducted in four regions of the Far East: Kamchatka, Magadan, Khabarovsk and Sakhalin. Marking will be carried out using two methods: thermal and “dry” (Munk et al. 1993; Safronenkov et al. 1999), and also by combination of both methods. A “dry” method of marking will be the dominant – as used for 75% of positions (lots) to be marked.

Salmon of the 2017 generation will be marked at 24 hatcheries of the Far East: 13 in Sakhalin, 5 in Kamchatka, 4 in Magadan, 2 in Khabarovsk regions. Totally, 30 mark patterns will be used. In some cases one and the same mark will be used for different salmon species. Of them, 22 marks will be used for chum, 10 for pink, 5 for coho, 2 for sockeye, 1 for chinook, and 1 for masu. As in the preceding years marking of juvenile salmon in the Far East will be carried out by two methods: thermal at 7 hatcheries and “dry” at 18 hatcheries. At one hatchery the combination of two methods will be used. Thermal marking will be conducted by decreasing temperature rate.

It should be mentioned that up to 80% marks will be made at the “pre-hatch” stage, and only about 20% at the “post-hatch” stage.

Otolith mark patterns are presented in the Uniform Hatch Code notation (Johnson et al. 2006).

References

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Table 1. Plan marks from Russia for 2017 brood year stocks of salmon

MARK TYPE	BROOD YEAR	SPECIES	COUNTRY	STATE/ PROVINCE	FACILITY	HATCH CODE	GRAPHIC IMAGE		MARK SCHEDULE
							PREHATCH	POSTHATCH	
1	2	3	4	5	6	7	8	9	10
DM	2017	Chum	Russia	Sakhalin	Buyuklovsky Hatchery	1,5H	I I I I I		(1X)24D:48W,(5X)24D:24W
DM+TM	2017	Chum	Russia	Sakhalin	Pobedinsky Hatchery	3nH4	III	I I I I	(3X)12D:12W+(4X)24C:24H
TM	2017	Chum	Russia	Sakhalin	Ado-Tymovsky Hatchery	H3,2,2		I I I I I I	(2X)24C:24H,(1X)24C:48H,(1X)24C:24H,(1X)24C:48H,(2X)24C:24H
TM	2017	Chum	Russia	Sakhalin	Berezhnyakovsky Hatchery	H1,4,1		I I I I I	(1X)24C:48H,(3X)24C:24H,(1X)24C:48H,(1X)24C:24H
TM	2017	Chum	Russia	Sakhalin	Sokolovsky Hatchery	H5,2		I I I I I I	(4X)24C:24H,(1X)24C:48H,(2X)24C:24H
DM	2017	Chum	Russia	Sakhalin	Bakhura Hatchery	3,3H	I I I I I		(2X)24D:24W,(1X)24D:48W,(3X)24D:24W
DM	2017	Chum	Russia	Sakhalin	Sokolnikovsky Hatchery	3n,3H	III I I		(2X)12D:12W,(1X)12D:36W,(3X)24D:24W
DM	2017	Chum	Russia	Sakhalin	Kalininsky Hatchery	3n,3nH	III III		(2X)12D:12W,(1X)12D:36W,(3X)12D:12W
DM	2017	Chum	Russia	Sakhalin	Yasnomorsky Hatchery	5H	I I I I I		(5X)24D:24W
DM	2017	Chum	Russia	Sakhalin	Urozhayny Hatchery	4n,2nH	III II		(3X)12D:12W,(1X)12D:36W,(2X)12D:12W
TM	2017	Chum	Russia	Sakhalin	Taranaysky Hatchery	H6		I I I I I	(6X)24C:24H
DM	2017	Chum	Russia	Sakhalin	Anivsky Hatchery	4n,2H	III I I		(3X)12D:12W,(1X)12D:36W,(2X)24D:24W
DM	2017	Chum	Russia	Magadan	Armansky Hatchery	3n,4H	III I I I I		(2X)12D:12W,(1X)12D:60W,(4X)24D:24W
DM	2017	Chum	Russia	Magadan	Olsky Hatchery	4,2H	I I I I I		(3X)24D:24W,(1X)24D:48W,(2X)24D:24W
DM	2017	Chum	Russia	Magadan	Olsky Hatchery	7H	I I I I I I		(7X)24D:24W
DM	2017	Chum	Russia	Magadan	Tauysky Hatchery	5,3nH	I I I I I III		(4X)24D:24W,(1X)24D:48W,(3X)12D:12W
DM	2017	Chum	Russia	Magadan	Yansky Hatchery	4,2nH	I I I I II		(3X)24D:24W,(1X)24D:48W,(2X)12D:12W
TM	2017	Chum	Russia	Khabarovsk	Kometa Hatchery	5,1H	I I I I I I		(4X)24C:24H,(1X)24C:48H,(1X)24C:24H
DM	2017	Chum	Russia	Khabarovsk	Aniuyusky Hatchery	6nH	IIIIII		(6X)12D:12W
DM	2017	Chum	Russia	Kamchatka	Ozerkovsky Hatchery	3,4H	I I I I I I		(2X)24D:24W,(1X)24D:48W,(4X)24D:24W
DM	2017	Chum	Russia	Kamchatka	Ketkinsky Hatchery	1,3,1H	I I I I I		(1X)24D:48W,(2X)24D:24W,(1X)24D:48W,(1X)24D:24W
TM	2017	Chum	Russia	Kamchatka	Paratunsky Hatchery	H3,1		I I I I	(2X)24C:24H,(1X)24C:48H,(1X)24C:24H

Table 1 (continued). Plan marks from Russia for 2017 brood year stocks of salmon

Mark TYPE	BROOD YEAR	SPECIES	COUNTRY	STATE/ PROVINCE	FACILITY	HATCH CODE	GRAPHIC IMAGE		MARK SCHEDULE
							PREHATCH	POSTHATCH	
1	2	3	4	5	6	7	8	9	10
DM	2017	Pink	Russia	Magadan	Armansky Hatchery	1,3,1H	I I I I I		(1X)24D:48W,(2X)24D:24W,(1X)24D:48W,(1X)24D:24W
DM	2017	Pink	Russia	Magadan	Olsky Hatchery	3,2nH	I I I I I		(2X)24D:24W,(1X)24D:48W,(2X)12D:12W
DM	2017	Pink	Russia	Magadan	Yansky Hatchery	6nH	I I I I I		(6X)12D:12W
DM	2017	Pink	Russia	Sakhalin	Anivsky Hatchery	3,4H	I I I I I I I		(2X)24D:24W,(1X)24D:48W,(4X)24D:24W
DM	2017	Pink	Russia	Sakhalin	Taranaysky Hatchery	5H	I I I I I		(5X)24D:24W
DM	2017	Pink	Russia	Sakhalin	Taranaysky Hatchery	5nH	I I I I I		(5X)12D:12W
TM	2017	Pink	Russia	Sakhalin	Taranaysky Hatchery	H5		I I I I I	(5X)24C:24H
DM	2017	Pink	Russia	Sakhalin	Urozhayny Hatchery	3,2H	I I I I I		(2X)24D:24W,(1X)24D:48W,(2X)24D:24W
DM	2017	Pink	Russia	Sakhalin	Pugachevsky Hatchery	1,4H	I I I I I		(1X)24D:48W,(4X)24D:24W
DM	2017	Pink	Russia	Sakhalin	Bakhura Hatchery	3n,4H	I I I I I I		(2X)12D:12W,(1X)12D:36W,(4X)24D:24W
DM	2017	Pink	Russia	Khabarovsk	Kometa Hatchery	5,1H	I I I I I I		(4X)24D:24W,(1X)24D:48W,(1X)24D:24W
TM	2017	Coho	Russia	Kamchatka	Paratunsky Hatchery	H3,2		I I I I I	(2X)24C:24H,(1X)24C:48H,(2X)24C:24H
DM	2017	Coho	Russia	Kamchatka	Viluysky Hatchery	3,1H	I I I I I		(2X)24D:24W,(1X)24D:48W,(1X)24D:24W
DM	2017	Coho	Russia	Magadan	Armansky Hatchery	1,2,1H	I I I I I		(1X)24D:48W,(1X)24D:24W,(1X)24D:48W,(1X)24D:24W
DM	2017	Coho	Russia	Magadan	Olsky Hatchery	7H	I I I I I I I		(7X)24D:24W
DM	2017	Coho	Russia	Magadan	Tauysky Hatchery	5,3nH	I I I I I I I		(4X)24D:24W,(1X)24D:48W,(3X)12D:12W
DM	2017	Coho	Russia	Magadan	Yansky Hatchery	5,1H	I I I I I I I		(4X)24D:24W,(1X)24D:48W,(1X)24D:24W
TM	2017	Sockeye	Russia	Kamchatka	Malkinsky Hatchery	3,2H	I I I I I		(2X)24C:24H,(1X)24C:48H,(2X)24C:24H
DM	2017	Sockeye	Russia	Kamchatka	Ozerkovsky Hatchery	3,4H	I I I I I I I		(2X)24D:24W,(1X)24D:48W,(4X)24D:24W
TM	2017	Chinook	Russia	Kamchatka	Malkinsky Hatchery	H3,1		I I I I I	(2X)48C:24H,(1X)48C:72H,(1X)48C:24H
DM	2017	Masu	Russia	Khabarovsk	Kometa Hatchery	6H	I I I I I I I		(6X)24D:24W