

Proposed Otolith Marks for Brood Year 2016 Salmon in Russia

by

Elena Akinicheva¹, Vladimir Volobuev², Evgeny Fomin², and Maksim Myakishev³

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

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

³Sakhalin 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

April 2016

THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:

Akinicheva, E., V. Volobuev, E. Fomin, and M. Myakishev. 2016. Proposed otolith marks for brood year 2016 salmon in Russia. NPAFC Doc. 1631. 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>).

Abstract

Mass-marking of juvenile salmon is the important tool, allowing definition an origin of a fish at all stages of his further life. In Russia, otolith-marking is used to provide information about the contribution of hatchery fish to commercial and cost-recovery fisheries during the summer fishing season. Besides in Russia make the researches directed on differentiation of factory and wild salmons during the early sea period. It allows to receive the information concerning distribution of a young salmon in the sea, its moving and abundance. Detection of the marked salmons in the period of an ocean residence allows determining an area of distribution and a way of migrations for salmons of a different origin. This will provide an opportunity to recognize the salmon from different reproduction areas and hatcheries (Kamchatka, Sakhalin, Magadan and Khabarovsk regions).

This document represents the plan marking of Pacific salmon for 2016 brood year in Russia.

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

Mark Plan for Brood Year 2016 Pacific Salmon in Russia

Otolith marking of salmon of 2016 brood year will be conducted in four regions of the Far East: Kamchatka, Magadan, Khabarovsk and Sakhalin regions. Marking will be carried out using two methods: thermal and “dry” (Munk et al., 1993; Safronenkov et al., 1999). Their application will be determined by the possibilities and specificity of water supply of incubated embryos at hatcheries of the Far East. The dominating method of marking will be a “dry” one – it will be used on the 80% of hatcheries. Two hatcheries will use both methods.

Salmon of 2016 generation will be marked at 25 hatcheries of the Far East: 14 in Sakhalin, 5 in Kamchatka, 3 in Magadan, 2 in Khabarovsk. Totally 31 marks will be used: 23 marks will be used for chum, 8 for pink, 6 for coho, 3 for sockeye, 1 for chinook, 1 for masu. Like in previous years marking of the juvenile salmon at the Far East will be carried out by using two methods: thermal at 6 hatcheries and “dry” at 20 hatcheries. Thermal marking will be conducted by decreasing temperature rate.

It is necessary to mention that otolith marking will dominate at the “prehatch” stage – 77%. Seven marks will be used at the “post hatch” stage. One and the same marks will be used for marking broods of different kinds of salmon for the convenience of controlling the returned fish.

Russian plan of marking is shown in the Table 1. Samples of thermal and “dry” marking are given in the system of Hatch code (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) 8 p. Alaska Department of Fish and Game, Juneau, Alaska 99801-5526, USA.

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.

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

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

Table1. Plan marks from Russia for 2016 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	2016	Chum	Russia	Magadan	Armansky Hatchery	3,3H	I I I I I I		(2X)24D:24W,(1X)24D:48W,(3X)24D:24W
DM	2016	Chum	Russia	Magadan	Olsky Hatchery	3,2H	I I I I I		(2X)24D:24W,(1X)24D:48W,(2X)24D:24W
DM	2016	Chum	Russia	Magadan	Olsky Hatchery	4,2nH	I I I I I I		(3X)24D:24W,(1X)24D:48W,(2X)12D:12W
DM	2016	Chum	Russia	Magadan	Tauysky Hatchery	7H	I I I I I I I		(7X)24D:24W
DM	2016	Chum	Russia	Magadan	Yansky Hatchery	3n-3nH	I I I I I		(2X)12D:12W,(1X)12D:84W,(3X)12D:12W
DM	2016	Chum	Russia	Kamchatka	Ozerkovsky Hatchery	1,5H	I I I I I I		(1X)24D:48W,(5X)24D:24W
DM	2016	Chum	Russia	Kamchatka	Ketkinsky Hatchery	3,4H	I I I I I I I		(2X)24D:24W,(1X)24D:48W,(4X)24D:24W
TM	2016	Chum	Russia	Kamchatka	Paratunsky Hatchery	H5,2		I I I I I I	(4X)24C:24H,(1X)24C:48H,(2X)24C:24H
TM	2016	Chum	Russia	Sakhalin	Ado-Tymovsky Hatchery	H6		I I I I I I	(6X)24C:24H
DM	2016	Chum	Russia	Sakhalin	Pobedinsky Hatchery	8nH	I I I I I I I		(8X)12D:12W
DM	2016	Chum	Russia	Sakhalin	Pobedinsky Hatchery	8nH3	I I I I I I I	I I I	(8X)12D:12W+(3X)24C:24H
DM	2016	Chum	Russia	Sakhalin	Buyuklovsky Hatchery	4,3H	I I I I I I I		(3X)24D:24W,(1X)24D:48W,(3X)24D:24W
TM	2016	Chum	Russia	Sakhalin	Sokolovsky Hatchery	H4,3		I I I I I I I	(3X)24H:24C,(1X)24H:48C,(3X)24H:24C
TM	2016	Chum	Russia	Sakhalin	Bereznaykovsky Hatchery	H4,2		I I I I I I	(3X)24C:24H,(1X)24C:48H,(2X)24C:24H
DM	2016	Chum	Russia	Sakhalin	Taranaysky Hatchery	5H	I I I I I		(5X)24D:24W
DM	2016	Chum	Russia	Sakhalin	Sokolnikovsky Hatchery	4,1H	I I I I I		(3X)24D:24W,(1X)24D:48W,(1X)24D:24W
DM	2016	Chum	Russia	Sakhalin	Yasnomorsky Hatchery	7nH	I I I I I I		(7X)12D:12W
DM	2016	Chum	Russia	Sakhalin	Kalininsky Hatchery	3n,1,2nH	I I I I I I		(2X)12D:12W,(1X)12D:60W,(1X)24D:48W,(2X)12D:12W
DM	2016	Chum	Russia	Sakhalin	Urozhayny Hatchery	5nH	I I I I I		(5X)12D:12W
DM	2016	Chum	Russia	Sakhalin	Bakhura Hatchery	3n,3H	I I I I I I		(2X)12D:12W,(1X)12D:60W,(3X)24D:24W
DM	2016	Chum	Russia	Sakhalin	Sova Hatchery	4H	I I I I I		(4X)24D:24W
DM	2016	Chum	Russia	Khabarovsk	Kometa Hatchery	4,2H	I I I I I I		(3X)24D:24W,(1X)24D:48W,(2X)24D:24W
DM	2016	Chum	Russia	Khabarovsk	Aniysky Hatchery	4nH	I I I I I		(4X)12D:12W

Table 1 (continued). Plan marks from Russia for 2016 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	2016	Pink	Russia	Magadan	Olsky Hatchery	4,3H	I I I I I I I		(3X)24D:24W,(1X)24D:48W,(3X)24D:24W
DM	2016	Pink	Russia	Magadan	Yansky Hatchery	5H	I I I I I		(5X)24D:24W
DM	2016	Pink	Russia	Sakhalin	Anivsky Hatchery	4,2H	I I I I I I		(3X)24D:24W,(1X)24D:48W,(2X)24D:24W
DM	2016	Pink	Russia	Sakhalin	Taranaysky Hatchery	5nH	IIII		(5X)12D:12W
DM	2016	Pink	Russia	Sakhalin	Urozhayny Hatchery	6nH	IIII		(6X)12D:12W
DM	2016	Pink	Russia	Sakhalin	Bakhura Hatchery	3,4nH	I I I III		(2X)24D:24W,(1X)24D:48W,(4X)12D:12W
DM	2016	Pink	Russia	Sakhalin	Pugachevsky Hatchery	3,2H	I I I I I		(2X)24D:24W,(1X)24D:48W,(2X)24D:24W
DM	2016	Pink	Russia	Khabarovsk	Kometa Hatchery	3n,4H	III I I I I		(2X)12D:12W,(1X)12D:60W,(4X)24D:24W
DM	2016	Coho	Russia	Magadan	Armansky Hatchery	1,4H	I I I I I		(1X)24D:48W,(4X)24D:24W
DM	2016	Coho	Russia	Magadan	Olsky Hatchery	4,3H	I I I I I I I		(3X)24D:24W,(1X)24D:48W,(3X)24D:24W
DM	2016	Coho	Russia	Magadan	Tauysky Hatchery	7H	I I I I I I I		(7X)24D:24W
DM	2016	Coho	Russia	Magadan	Yansky Hatchery	3n,3nH	III III		(2X)12D:12W,(1X)12D:60W,(3X)12D:12W
TM	2016	Coho	Russia	Kamchatka	Paratunsky Hatchery	H3,3		I I I I I I	(2X)24C:24H,(1X)24C:48H,(3X)24C:24H
DM	2016	Coho	Russia	Kamchatka	Viluysky Hatchery	1,5H	I I I I I I		(1X)24D:48W,(5X)24D:24W
TM	2016	Chinook	Russia	Kamchatka	Malkinsky Hatchery	H3,4		I I I I I I I	(2X)24C:24H,(1X)24C:48H,(4X)24C:24H
TM	2016	Sockeye	Russia	Kamchatka	Malkinsky Hatchery	3,4H	I I I I I I I		(2X)24C:24H,(1X)24C:48H,(4X)24C:24H
DM	2016	Sockeye	Russia	Kamchatka	Ozerkovsky Hatchery	3,2,2H	I I I I I I I		(2X)24D:24W,(1X)24D:48W,(1X)24D:24W,(1X)24D:48W,(2X)24D:24W
DM	2016	Sockeye	Russia	Magadan	Olsky Hatchery	4,2H	I I I I I I		(3X)24D:24W,(1X)24D:48W,(2X)24D:24W
TM	2016	Masu	Russia	Khabarovsk	Kometa Hatchery	3,3H	I I I I I I		(2X)24H:24C,(1X)24H:48C,(3X)24H:24C