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**Proposed Thermal and Dry Marks for Brood Year 2002 Salmon
in Russia**

by

Elena Akinicheva, Alexander Rogatnykh

Magadan Scientific and Research Institute
of Fisheries and Oceanography,
Magadan, Russia

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Proposed Thermal and Dry Marks for Brood Year 2002 Salmon in Russia

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Abstract

In Russia, mass-marking of salmon using to explore migrations and survival of the salmon in the ocean, determine the portion of this fish in the mixed stocks and estimate the efficiency of artificial reproduction efforts. Otolith marking programs are being implemented in the Magadan, Kamchatka and Sakhalin regions of Russia. For Brood Year 2002, we plan to mark approximately 13 million sockeye, 1 million chinook, 50 million chum, 1 million coho. Salmon will be marked at 14 different hatcheries using approximately 12 unique mark patterns. In addition, we plan to experimental mark chum salmon at the North Sakhalin hatcheries for the first time.

Introduction

The analysis of the marks allow to determine efficiently the portion of the hatchery fish in the total stock, and also get the information about the ways of different salmon stocks migration and the spots of their location in the ocean. We use both thermal and dry methods. In 1998 we have offer to use a first ring of mark for differentiation Russia and Japanese salmons. As base mark three or four rings in the first band have been adopted to distinguish Russian chum and pink salmon from other stocks since 1999 brood year stocks with Japanese side contractually. However we have duplication of marks of Russian, American and Canadian salmons at present.

Plan for 2002 brood year stocks

The proposed thermal marks for the 2002 brood year salmon is shown in Tables. We plan to mark approximately 65 million salmon. In Russia basically use dry method of marking. We plan to mark all number of salmons at the Magadan and Kamchatka hatcheries. Marking is expected to conduct on embryos. Presumably, only chinook salmon on Malkinskiy hatchery will be of marking after hatch by thermal method. The differences between the 2002 and 2001 brood we plan to mark at five Sakhalin hatcheries only experimental marking for chum and pink salmon. Some Sakhalin hatcheries form a marks of unsatisfactory quality sometimes. So us necessary to choose optimum methods for different conditions at the different hatcheries. For experiment will be used both thermal (raising and reduction of temperature of water) and dry (Akinicheva et al., 1998; Safronenkov et al., 1999) methods of marking. The marking pattern is presented as the RBr notation (Munk and Geiger 1998; Hagen 1999) and Hatch code notation (Hagen et al. 2000).

References

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Table1. Proposed otolith marks releases from Russia for 2002 brood year stocks of salmon.

?	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	AGENCY	FACILITY	FINAL RELEASE SITE	NUMBER OF TM RELEASED
1	2	3	4	5	6	7	8	9	10
R02-1	2002	2003	chum	Russia	Magadan	OhotskRV	Yanskiy	Tauy Bay	*
R02-2	2002	2003	coho	Russia	Magadan	OhotskRV	Yanskiy	Tauy Bay	*
R02-3	2002	2003	sockeye	Russia	Magadan	OhotskRV	Yanskiy	Tauy Bay	*
R02-4	2002	2003	chum	Russia	Magadan	OhotskRV	Armanskiy	Tauy Bay	*
R02-5	2002	2003	coho	Russia	Magadan	OhotskRV	Armanskiy	Tauy Bay	*
R02-6	2002	2003	sockeye	Russia	Magadan	OhotskRV	Armanskiy	Tauy Bay	*
R02-7	2002	2003	chum	Russia	Magadan	OhotskRV	Olskiy	Tauy Bay	*
R02-8	2002	2003	coho	Russia	Magadan	OhotskRV	Olskiy	Tauy Bay	*
R02-9	2002	2003	sockeye	Russia	Magadan	OhotskRV	Olskiy	Tauy Bay	*
R02-10	2002	2003	chum	Russia	Magadan	OhotskRV	Tauyskiy	Tauy Bay	*
R02-11	2002	2003	chum	Russia	Magadan	MagadanNIRO	Olskiy	Tauy Bay	*
* - hatcheries of Magadan are not accomplished collection of fishes eggs									
R02-12	2002	2003	chinook	Russia	Kamchatka	KamchatRV	Malkinsky	West Kam	940,000
R02-13	2002	2003	sockeye	Russia	Kamchatka	KamchatRV	Malkinsky	West Kam	830,000
R02-14	2002	2003	chum	Russia	Kamchatka	KamchatRV	Ketkinskiy	East Kam	8,840,000
R02-15	2002	2003	chum	Russia	Kamchatka	KamchatRV	Ozerki	West Kam	5,020,000
R02-16	2002	2003	sockeye	Russia	Kamchatka	KamchatRV	Ozerki	West Kam	9,730,000
R02-17	2002	2003	chum	Russia	Kamchatka	KamchatRV	Paratunskiy	East Kam	20,050,000
R02-18	2002	2003	chum	Russia	Kamchatka	KamchatRV	Viluyskiy	East Kam	830,000
R02-19	2002	2003	Pink	Russia	Sahalin	SakhRV	Taranayskiy	Sahalin	* 100 000
R02-20	2002	2003	Pink	Russia	Sahalin	SakhRV	Taranayskiy	Sahalin	100,000
R02-21	2002	2003	Pink	Russia	Sahalin	SakhRV	Taranayskiy	Sahalin	100,000
R02-22	2002	2003	Chum	Russia	Sahalin	Pelenga	Bereznykovsky	Sahalin	100,000
R02-23	2002	2003	Chum	Russia	Sahalin	Pelenga	Bereznykovsky	Sahalin	100,000
R02-24	2002	2003	Chum	Russia	Sahalin	Pelenga	Bereznykovsky	Sahalin	600,000
R02-25	2002	2003	Chum	Russia	Sahalin	SakhRV	Ado-Tymovskiy	Sahalin	500,000
R02-26	2002	2003	Chum	Russia	Sahalin	SakhRV	Ado-Tymovskiy	Sahalin	500,000
R02-27	2002	2003	Chum	Russia	Sahalin	SakhRV	Ado-Tymovskiy	Sahalin	500,000
R02-28	2002	2003	Chum	Russia	Sahalin	SakhRV	Bujuklovskiy	Sahalin	500,000
R02-29	2002	2003	Chum	Russia	Sahalin	SakhRV	Bujuklovskiy	Sahalin	500,000
R02-30	2002	2003	Chum	Russia	Sahalin	SakhRV	Bujuklovskiy	Sahalin	500,000
R02-31	2002	2003	Chum	Russia	Sahalin	SakhRV	Pobedinskiy	Sahalin	500,000
R02-32	2002	2003	Chum	Russia	Sahalin	SakhRV	Pobedinskiy	Sahalin	500,000
R02-33	2002	2003	Chum	Russia	Sahalin	SakhRV	Pobedinskiy	Sahalin	500,000

* - Sachalin hatcheries - only experimental marking

Table1. (continued). Proposed otolith marks releases from Russia for 2002 brood year stocks of salmon.

?	RBr CODE	HATCH	GRAPHIC IMAGE		OTOLITH MARK SCHEDULE	DIRECTION
			PREHATCH	POSTHATCH		
1	11	12	13	14	15	16
R02-1	1[1.5]	5H	I I I I I		(5X)24D:24W	dry
R02-2	1[1.5]	5H	I I I I I		(5X)24D:24W	dry
R02-3	1[1.5]	5H	I I I I I		(5X)24D:24W	dry
R02-4	1[1.7]	7H	I I I I I I I		(7X)24D:24W	dry
R02-5	1[1.7]	7H	I I I I I I I		(7X)24D:24W	dry
R02-6	1[1.7]	7H	I I I I I I I		(7X)24D:24W	dry
R02-7	1[1.5-2.2]	5,2H	I I I I I I I		(4X)24D:24W,(1X)24D:72W,(2X)24D:24W	dry
R02-8	1[1.5-2.2]	5,2H	I I I I I I I		(4X)24D:24W,(1X)24D:72W,(2X)24D:24W	dry
R02-9	1[1.5-2.2]	5,2H	I I I I I I I		(4X)24D:24W,(1X)24D:72W,(2X)24D:24W	dry
R02-10	1[1.6]	6H	I I I I I I I		(6X)24D:24W	dry
R02-11	1[1.8]	8H	I I I I I I I I I		(8X)24D:24W	dry
R02-12	2[1.3]	H3		I I I	(3X)24H:24C	up
R02-13	1[1.3,2.1-3.1]	3,2-1H	I I I I I		(2?)24D:24W,(1?)24D:48W,(1?)24D:72W,(1?)24D:24W	dry
R02-14	1[1.3,2.4]	3,4H	I I I I I I I		(2?)24D:24W,(1?)24D:48W,(4?)24D:24W	dry
R02-15	1[1.3,2.1,3.2]	3,1,2H	I I I I I I I		(2?)24D:24W,(1?)24D:48W,(1?)24D:48W,(2?)24D:24W	dry
R02-16	1[1.3,2.1,3.2]	3,1,2H	I I I I I I I		(2?)24D:24W,(1?)24D:48W,(1?)24D:48W,(2?)24D:24W	dry
R02-17	1[1.3]	3H	I I I		(3X)24D:24W	dry
R02-18	1[1.3,2.1-3.1]	3,2-1H	I I I I I		(2?)24D:24W,(1?)24D:48W,(1?)24D:72W,(1?)24D:24W	dry
R02-19	1[1.3-2.3]	3-3H	I I I I I I I		(2?)24H:24C,(1?)24H:72C,(3?)24H:24C	up
R02-20	1[1.3-2.3]	3-3H	I I I I I I I		(2?)24H:24C,(1?)24H:72C,(3?)24H:24C	down
R02-21	1[1.3-2.3]	3-3H	I I I I I I I		(2?)24H:24C,(1?)24H:72C,(3?)24H:24C	dry
R02-22	1[1.4-2.4]	4-4H	I I I I I I I I I		(3?)24H:24C,(1?)24H:72C,(4?)24H:24C	up
R02-23	1[1.4-2.4]	4-4H	I I I I I I I I I		(3?)24H:24C,(1?)24H:72C,(4?)24H:24C	down
R02-24	1[1.4-2.4]	4-4H	I I I I I I I I I		(3?)24H:24C,(1?)24H:72C,(4?)24H:24C	dry
R02-25	1[1.4-2.3]	4-3H	I I I I I I I		(3?)24H:24C,(1?)24H:72C,(3?)24H:24C	up
R02-26	1[1.4-2.3]	4-3H	I I I I I I I		(3?)24H:24C,(1?)24H:72C,(3?)24H:24C	down
R02-27	1[1.4-2.3]	4-3H	I I I I I I I		(3?)24H:24C,(1?)24H:72C,(3?)24H:24C	dry
R02-28	1[1.4-22,3.1]	4-2,1H	I I I I I I I I I		(3?)24H:24C,(1?)24H:72C,(1?)24H:24C,(1?)24H:48C,(1?)24H:24C	up
R02-29	1[1.4-22,3.1]	4-2,1H	I I I I I I I I I		(3?)24H:24C,(1?)24H:72C,(1?)24H:24C,(1?)24H:48C,(1?)24H:24C	down
R02-30	1[1.4-22,3.1]	4-2,1H	I I I I I I I I I		(3?)24H:24C,(1?)24H:72C,(1?)24H:24C,(1?)24H:48C,(1?)24H:24C	dry
R02-31	1[1.4-2.2]	4-2H	I I I I I I I		(3?)24H:24C,(1?)24H:72C,(2?)24H:24C	up
R02-32	1[1.4-2.2]	4-2H	I I I I I I I		(3?)24H:24C,(1?)24H:72C,(2?)24H:24C	down
R02-33	1[1.4-2.2]	4-2H	I I I I I I I		(3?)24H:24C,(1?)24H:72C,(2?)24H:24C	dry