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**Thermal and Dry Marks on Salmon Released for Brood Year 2001
in Russia.**

by

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Abstract

Marking of the bred salmon is used 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. 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.

Introduction

The releases thermally and dry marked salmon of the 2002 brood year is shown in Tables 1, 2. The marking pattern is presented as the RBr notation (Munk and Geiger 1998; Hagen 1999) and Hatch code notation (Hagen et al. 2000).

Releases of 2001 brood year stocks

Approximately, 62 million salmon with otolith marks were released in Russia in 2002. Salmon were mark at 12 hatcheries, they were used 15 unique mark patterns. In 1998 we have offer to use a first ring of mark for differentiation Russia and Japanese salmon. 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 salmon at present.

We used both thermal and dry methods for marking a brood 2001. In June 2002 approximately 62 million salmon with 12 dry and 3 thermal mark patterns were released in Russia in 2002. Some Sakhalin hatcheries form a marks of unsatisfactory quality sometimes. One of the ill-conditioned reasons was too early marking. However, bad read marks were formed at optimum conditions of marking too. Probably, us necessary to choose optimum methods for hatcheries of different regions. For experiment will be used both thermal (raising and reduction of temperature of water) and dry (Akinicheva et al., 1998; Safronkov et al., 1999) methods of marking.

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Table1.Otolith marks released from Russia for 2001 brood year stocks of salmon.

?	ID#	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	AGENCY	FACILITY	FINAL RELEASE SITE	REARING TREATMENT	STAGE	NUMBER OF RELEASED	RBr
1	2	3	4	5	6	7	8	9	10	10	11	12	13
R01-1	DM	2001	2002	Pink	Russia	Magadan	OhotskRV	Yanskiy	Tauy Bay	fed	fry	3,761,000	1[1.6]
R01-2	DM	2001	2002	Coho	Russia	Magadan	OhotskRV	Yanskiy	Tauy Bay	fed	fry	1,721,400	1[1.6]
R01-3	DM	2001	2002	Chum	Russia	Magadan	OhotskRV	Armanskiy	Tauy Bay	fed	fry	1,235,000	1[1.5-2.3]
R01-4	DM	2001	2002	Chum	Russia	Magadan	OhotskRV	Olskiy	Tauy Bay	fed	fry	1,140,000	1[1.5-2.2]
R01-5	DM	2001	2002	Coho	Russia	Magadan	OhotskRV	Olskiy	Tauy Bay	fed	fry	303,100	1[1.5-2.2]
R01-6	TM	2001	2002	Sockeye	Russia	Magadan	OhotskRV	Olskiy	Tauy Bay	fed	fry	950,000	1[1.5-2.2]
R01-7	DM	2001	2002	Chum	Russia	Magadan	MagadanNIRO	Olskiy	Tauy Bay	fed	fry	700,000	1[1.7]
R01-8	TM	2001	2002	Chinook	Russia	Kamchatka	KamchatRV	Malkinsky	West Kam	fed	fry	297,240	2[1.3,2.2]
R01-9	TM	2001	2002	Sockeye	Russia	Kamchatka	KamchatRV	Malkinsky	West Kam	fed	fry	414,560	1[1.3,2.4]
R01-10	DM	2001	2002	Chum	Russia	Kamchatka	KamchatRV	Ketkinsky	East Kam	fed	fry	1,597,560	1[1.3,2.3]
R01-11	DM	2001	2002	Chum	Russia	Kamchatka	KamchatRV	Ozerki	West Kam	fed	fry	5,257,140	1[1.3,2.5]
R01-12	DM	2001	2002	Sockeye	Russia	Kamchatka	KamchatRV	Ozerki	West Kam	fed	fry	7,656,600	1[1.3,2.5]
R01-13	DM	2001	2002	Chum	Russia	Kamchatka	KamchatRV	Paratunskiy	East Kam	fed	fry	6,646,900	1[1.3,2.2n]
R01-14	DM	2001	2002	Chum	Russia	Kamchatka	KamchatRV	Paratunskiy	East Kam	fed	fry	1,868,600	1[1.3,2.1]
R01-15	DM	2001	2002	Chum	Russia	Kamchatka	KamchatRV	Paratunskiy	East Kam	fed	fry	968,200	1[1.3]
R01-16	DM	2001	2002	Pink	Russia	Sahalin	SakhRV	Sahalin	Sahalin	fed	fry	9,420,000	1[1.3-2.2-3.1]
R01-17	DM	2001	2002	Pink	Russia	Sahalin	Pelenga	Monetka	Sahalin	fed	fry	8,184,400	1[1.3-2.1-3.2]
R01-18	DM	2001	2002	Chum	Russia	Sahalin	SakhRV	Sokolovsky	Sahalin	fed	fry	8,041,700	1[1.4 -2.3]
R01-19	DM, TM	2001	2002	Chum	Russia	Sahalin	SakhRV	Bereznykovsky	Sahalin	fed	fry	1,772,600	1[1.4 -2.1,3.2]

Table1.(continied).Otolith marks released from Russia for 2001 brood year stocks of salmon.

?	HATCH CODE	GRAPHIC IMAGE		MARK SCHEDULE	QUALITY OF MARK	COMMEENTS	DIRECTION
		PREHATCH	POSTHATCH				
1	14	15	16	17	18	19	20
R01-1	6H	I I I I I I		(6X) 24H:24C	good		dry
R01-2	6H	I I I I I I		(6X) 24H:24C	good		dry
R01-3	5-3H	I I I I I I I I		(4?)24H:24W,(1X)24D:72W, (3?)24H:24W	bad	weak bands	dry
R01-4	5-2H	I I I I I I I		(4?)24H:24W,(1X)24D:72W, (2?)24H:24W	60% bad	too early marking, weak bands	dry
R01-5	5-2H	I I I I I I I		(4?)24H:24W,(1X)24D:72W, (2?)24H:24W	good		dry
R01-6	5-2H	I I I I I I I		(4?)24H:24W,(1X)24D:72W, (2?)24H:24W	good		up
R01-7	7H	I I I I I I I		(7?)24H:24W	20% bad	too early marking	dry
R01-8	H3,2		I I I I I	(2X)24H:24C,(1X)24H:48C,(2X)24H:24C	good		up
R01-9	3,4H	I I I I I I I		(2X)24H:24C,(1X)24H:48C,(4X)24H:24C	good		up
R01-10	3,3H	I I I I I I		(2X)24D:24W,(1X)24D:48W,(3X)24D:24W	good		dry
R01-11	3,5H	I I I I I I I I		(2X)24D:24W,(1X)24D:48W,(5X)24D:24W	good		dry
R01-12	3,5H	I I I I I I I I		(2X)24D:24W,(1X)24D:48W,(5X)24D:24W	good		dry
R01-13	3,2nH	I I I I I		(2X)24D:24W,(1X)24D:48W,(2X)12D:12W	good		dry
R01-14	3,1H	I I I I I		(2X)24D:24W,(1X)24D:48W,(1X)24D:24W	good		dry
R01-15	3H	I I I I I		(3X)24D:24W	good		dry
R01-16	3-2-1H	I I I I I I I		(2X)24HD:24W,(1X)24D:72W,(1X)24D:24W,(1X)24D:72W,(1X)24D:24W	noneven intervals		dry
R01-17	3-1-2H	I I I I I I I		(2X)24HD:24W,(1X)24D:72W,(1X)24D:72W,(2X) 24D:24W	good		dry
R01-18	4-3H	I I I I I I I		(3X)24HD:24W,(1X)24D:72W,(3X)24D:24W	good		dry
R01-19	4-1,2H	I I I I I I I		(3X)24D:24W,(1X)24D:72W,(1X)24C:48H,(2X)24C:24H	70%bad	too early marking, weak bands	dry + down