

## **Proposed Otolith Marks for Brood Year 2005 Salmon in Russia**

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Submitted to the

**NORTH PACIFIC ANADROMOUS FISH COMMISSION**

by

**Russia**

April 2005

**THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:**

E. Akinicheva. 2003. Proposed thermal and dry marks for brood year 2003 salmon in Russia. (NPAFC Doc. 846) 5p. Magadan Scientific and Research Institute of Fisheries and Oceanography (MagadanNIRO), 36/10 Portovaya St., Magadan, 685000, Russia.

# **Proposed Thermal and Dry Marks for Brood Year 2005 Salmon in Russia**

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## **Abstract**

Otolith marking remains an important method for both researches and fisheries management in Russia. Totally 18 types of otolith marks are supposed to apply for 2005 brood year at 14 Russian hatcheries situated in Magadan, Kamchatka, Sakhalin and Khabarovsk regions. Thermal and dry methods will be used to stimulate marks' development on salmon otoliths.

Identification of the marked fishes in the mixed aggregation of salmon allows to evaluate hatcheries' efficiency using an final product of their activity - returns of mature salmon to the places of reproduction. We are going to determine hatchery origins of adult fishes caught in coastal waters with help of marks on their otoliths.

Otolith marks will be used for researching of juveniles' migration, growth, survival rate and feeding habits in the northern Okhotsk Sea, waters off Kamchatka and Sakhalin, and in the Bering Sea.

In addition, a proportion of wild salmon and fishes released from the hatcheries defined during their sea life period will allow estimating an influence of fish-breeding activity on condition of wild salmon populations.

In 2005 14 Russian hatcheries in four regions (Kamchatka, Magadan, Sakhalin and Khabarovsk) are planning to conduct marking of Pacific salmon. All cultured salmon species will be marked with 18 different types of marks.

Magadan and Kamchatka hatcheries will use a dry method of marking.

Anuyskiy hatchery (Khabarovsk Region) will continue marking of chum. Additionally a small number of masu salmon is assumed to be marked there at the first time. Dry method of marking is supposed to use on that hatchery because of the absence of an opportunity for thermal marking.

The possibility of thermal marking at Sakhalin hatcheries in 2005 is still discussed now. However, we assume to use a thermal method of marking at some hatcheries next years.

Geographic origin of salmon will be coded in the first block of marks. Three rings for Kamchatka; four rings on chum and three or four rings on pink salmon otoliths have been planned for Sakhalin (pink salmon is not cultured in Kamchatka). Salmon originated in

Magadan and Khabarovsk hatcheries will have marks with not less than five rings in the first block. Both thermal (sequential increase and reduction of water temperature) and dry (Akinicheva et al., 1998; Safronkov et al., 1999) methods of marking will be used for experiment. The marking patterns will be presented as the RBr notation (Munk and Geiger 1998; Hagen 1999) and Hatch code notation (Hagen et al. 2000).

### **References**

- Akinicheva E., A. Rogatnykh, and B. Safronkov. 1998. Mass marking of salmon and identification of hatchery fish in mixed stocks. (NPAFC Doc. 379). Pacific Research Institute of Fishery and Oceanography, Magadan Branch, Magadan, Russia. 8p.
- Safronkov B. P., E.G. Akinicheva, and A.Y. Rogatnykh. The Dry Method of Salmon Otolith Mass Marking. 1999. International Symposium "Recent Changes in Ocean Production of Pacific Salmon". Juneau, Alaska, USA, November 1-2, 1999. p.81-82.
- Munk, K. M., and H. J. Geiger. 1998. Thermal marking of otoliths: the "RBr" coding structure of thermal marks. (NPAFC Doc. 367) 19 p. CWT & Otolith Processing Lab., Alaska Department of Fish and Game, Juneau, Alaska, USA.
- Hagen, P. 1999. A modeling approach to address the underlying structure and constraints of thermal mark codes and code notation. (NPAFC Doc. 395) 12 p. Alaska Department of Fish and Game, Juneau, Alaska 99801-5526, USA.

Table1.Plan marks 2005 brood year stocks of salmon in Russia .

ID	Mark Type	Yr Brood	Yr Released	Species	Country	State Province	Region Released	Agency	Facility	Stock
R05-01	DM	2005	2006	CHUM	Russia	Magadan	Tauy Bay	ORV	Armansky Hatchery	Yama River
R00-02	DM	2005	2006	CHUM	Russia	Magadan	Tauy Bay	ORV	Armansky Hatchery	Yama River
R00-03	DM	2005	2006	CHUM	Russia	Magadan	Tauy Bay	ORV	Yansky Hatchery	Yama River
R05-04	DM	2005	2006	CHUM	Russia	Magadan	Tauy Bay	ORV	Olsky Hatchery	Lankovaya River
R05-05	DM	2005	2006	CHUM	Russia	Magadan	Tauy Bay	ORV	Olsky Hatchery	Yama River
R05-06	DM	2005	2006	CHUM	Russia	Magadan	Tauy Bay	ORV	Olsky Hatchery	Yama River
R05-07	DM	2005	2006	CHUM	Russia	Magadan	Tauy Bay	MagadanNIRO	Olsky Hatchery	Kulkuty River
R05-08	DM	2005	2006	CHUM	Russia	Magadan	Tauy Bay	ORV	Tauysky Hatchery	Tauy River
R05-09	DM	2005	2006	COHO	Russia	Magadan	Tauy Bay	ORV	Armansky Hatchery	Yama River
R05-11	DM	2005	2006	COHO	Russia	Magadan	Tauy Bay	ORV	Armansky Hatchery	Yama River
R05-12	DM	2005	2006	COHO	Russia	Magadan	Tauy Bay	ORV	Yansky Hatchery	Yama River
R05-13	DM	2005	2006	COHO	Russia	Magadan	Tauy Bay	ORV	Olsky Hatchery	Yama River
R05-14	DM	2005	2006	COHO	Russia	Magadan	Tauy Bay	ORV	Tauysky Hatchery	Tauy River
R05-15	DM	2005	2006	PINK	Russia	Magadan	Tauy Bay	ORV	Olsky Hatchery	Ola River
R05-16	DM	2005	2006	PINK	Russia	Magadan	Tauy Bay	ORV	Yansky Hatchery	Yama River
R05-17	DM	2005	2006	SOCKEYE	Russia	Magadan	Tauy Bay	ORV	Olsky Hatchery	Ola River
R05-18	DM	2005	2006	CHUM	Russia	Kamchatka	West Kamchatka	KamchatRV	Ozerkovsky Hatchery	Bolshaya River
R05-19	DM	2005	2006	CHUM	Russia	Kamchatka	East Kamchatka	KamchatRV	Ketkinsky Hatchery	Avacha River
R05-20	DM	2005	2006	CHUM	Russia	Kamchatka	East Kamchatka	KamchatRV	Paratunsky Hatchery	Paratunka River
R05-21	DM	2005	2006	CHUM	Russia	Kamchatka	East Kamchatka	KamchatRV	Viluysky Hatchery	Bolshoy Viluy Lake
R05-22	DM	2005	2006	SOCKEYE	Russia	Kamchatka	West Kamchatka	KamchatRV	Ozerkovsky Hatchery	Bolshaya River
R05-23	TM	2005	2006	SOCKEYE	Russia	Kamchatka	West Kamchatka	KamchatRV	Malkinsky Hatchery	Bolshaya River
R05-24	TM	2005	2006	CHINOOK	Russia	Kamchatka	West Kamchatka	KamchatRV	Malkinsky Hatchery	Bolshaya River
R05-25	TM	2005	2006	CHUM	Russia	Sakhalin	Nyisky Bay	SakhRV	Ado-Tymovsky Hatchery	Tym River
R05-26	TM	2005	2006	CHUM	Russia	Sakhalin	Terpeniya Bay	SakhRV	Bujuklovsky Hatchery	Poronay River
R05-27	TM	2005	2006	CHUM	Russia	Sakhalin	Terpeniya Bay	SakhRV	Pobedinsky Hatchery	Poronay River
R05-28	TM	2005	2006	CHUM	Russia	Sakhalin	Okhotsk Sea	SakhRV	Bereznykovsky Hatchery	Nayba River
R05-29	TM	2005	2006	PINK	Russia	Sakhalin	Okhotsk Sea	SakhRV	Bereznykovsky Hatchery	Nayba River
R05-30	DM	2005	2006	CHUM	Russia	Khabarovsk	Tatarsky Strait	AmurRV	Aniuysky Hatchery	To Lake
R05-31	DM	2005	2006	Masu	Russia	Khabarovsk	Tatarsky Strait	AmurRV	Aniuysky Hatchery	Kopi River

Table1. (continued). Plan marks 2005 brood year stocks of salmon in Russia .

ID	Release Site	Stage	RBr	Hatch code	Prehatch graphic	Posthatch graphic	Thermal mark schedule
R05-01	Arman River	Fed Fry	1[1.5]	5H	I I I I I		(5X)24D:24W
R00-02	Glukhoye Lake	Fed Fry	1[1.5]	5H	I I I I I		(5X)24D:24W
R00-03	Yana River	Fed Fry	1[1.6]	6H	I I I I I I		(6X)24D:24W
R05-04	Ola River	Fed Fry	1[1.7]	7H	I I I I I I I		(7X)24D:24W
R05-05	Ola River	Fed Fry	1[1.7]	7H	I I I I I I I		(7X)24D:24W
R05-06	Staraya Besyolaya bight.	Fed Fry	1[1.7]	7H	I I I I I I I		(7X)24D:24W
R05-07	Gulf Odyan	Fed Fry	1[1.5,2.2]	5,2H	I I I I I I I		(4X)24D:24W,(1X)24D:48W,(2X)24D:24W
R05-08	Tauy River	Fed Fry	1[1.8]	8H	I I I I I I I I		(8X)24D:24W
R05-09	Arman River	Fed Fry	1[1.5]	5H	I I I I I		(5X)24D:24W
R05-11	Glukhoye Lake		1[1.5]	5H	I I I I I		(5X)24D:24W
R05-12	Yana River	Fed Fry	1[1.6]	6H	I I I I I I		(6X)24D:24W
R05-13	Ola River	Fed Fry	1[1.6]	6H	I I I I I I		(6X)24D:24W
R05-14	Tauy River	Fed Fry	1[1.8]	8H	I I I I I I I I		(8X)24D:24W
R05-15	Ola River	Fed Fry	1[1.7]	7H	I I I I I I I		(7X)24D:24W
R05-16	Yana River	Fed Fry	1[1.6]	6H	I I I I I I		(6X)24D:24W
R05-17	Ola River	Fed Fry	1[1.7]	7H	I I I I I I I		(7X)24D:24W
R05-18	Bolshaya River	Fed Fry	1[1.3,2.1,3.2]	3,1,2H	I I I I I I		(2X)24D:24W,(2X)24D:48W,(2X)24D:24W
R05-19	Avacha River	Fed Fry	1[1.3,2.4]	3,4H	I I I I I I I		(2X)24D:24W,(1X)24D:48W,(4X)24D:24W
R05-20	Paratunka River	Fed Fry	1[1.3,2.1]	3,1H	I I I I		(2X)24D:24W,(2X)24D:48W,(2X)24D:24W
R05-21	Bolshoy Viluy Lake	Fed Fry	1[1.3,2.1,3.1]	3,1,1H	I I I I I		(2X)24D:24W,(3X)24D:48W
R05-22	Bolshaya River	Fed Fry	1[1.3,2.2,3.2]	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
R05-23	Bolshaya River	Fed Fry	1[1.3,2.4]	3,4H	I I I I I I I		(2X)24D:24W,(1X)24D:48W,(4X)24D:24W
R05-24	Bolshaya River	Fed Fry	2[1.3,2.1]	H3,1		I I I I	posthatch (2X)24H:24C, (2X)24H:48C
R05-25	Tym River	Fed Fry	1[1.4,2.4]	4,4H	I I I I I I I I		(3X)24H:24C,(1X)24H:48C,(4X)24H:24C
R05-26	Poronay River	Fed Fry	1[1.4,2.3]	4,3H	I I I I I I I		(3X)24H:24C,(1X)24H:48C,(3X)24H:24C
R05-27	Poronay River	Fed Fry	1[1.4,2.2]	4,2H	I I I I I I		(3X)24H:24C,(1X)24H:48C,(2X)24H:24C
R05-28	Nayba River	Fed Fry	1[1.3,2.2]	3,2H	I I I I I		(2X)24H:24C,(1X)24H:48C,(2X)24H:24C
R05-29	Nayba River	Fed Fry	1[1.3,2.4]	3,4H	I I I I I I I		(2X)24H:24C,(1X)24H:48C,(4X)24H:24C
R05-30	Tikhoye Lake	Fed Fry	1[1.3,2.3]	3,3H	I I I I I I		(2X)24H:24C,(1X)24H:48C,(3X)24H:24C
R05-31	Tikhoye Lake	Fed Fry	1[1.3,2.3]	3,3H	I I I I I I		(2X)24H:24C,(1X)24H:48C,(3X)24H:24C