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Proposed Thermal Marks for Brood Year 2001 Salmon in Japan

by

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Abstract

The initial aim of thermal mark programs is to provide information for the ocean migration and survival of each regional salmon stock in Japan. We plan to mark brood year 2001 salmon (approximately 49 million chum, 1.8 million pink, and 190 thousand masu salmon) from five hatcheries with 17 discrete patterns. All chum salmon released from Chitose and Shizunai Hatchery will be marked. The proposed otolith mark plan is similar to the 2000 brood year program, except that we plan to mark chum salmon at Katagishi Hatchery in northeast Honshu and masu salmon at Chitose Hatchery in Hokkaido for the first time.

Introduction

The initial aim of thermal mark programs is to provide information for the ocean migration and survival of each regional salmon stocks in Japan (Urawa et al. 2000). Thermal marks are used for juvenile migration, growth, survival, and feeding surveys along the coast of Hokkaido, and for offshore migration surveys in the Sea of Okhotsk, North Pacific Ocean, and Bering Sea. In addition, we will determine hatchery origins of adults in the coastal catches using thermal marks. The present report proposes thermal otolith marks applied to brood year 2001 salmon in Japan.

Plan for 2001 brood year stocks

The proposed thermal marks for the 2001 brood year salmon is shown in Table 1. We plan to mark brood year 2001 salmon (approximately 49 million chum, 1.8 million pink, and 190 thousand masu salmon) from five hatcheries with 17 discrete patterns. All chum salmon released from Chitose and Shizunai Hatchery will be marked. The proposed plan is similar to the 2000 brood year program, except that we plan to mark chum salmon at Katagishi Hatchery in northeast Honshu and masu salmon at Chitose Hatchery in Hokkaido for the first time. The marking pattern is presented as the RBr notation (Munk and Geiger 1998) with modification of narrow ring bands by Hagen (1999). As base mark two rings in the first band have been adopted to distinguish Japanese salmon from other stocks since 1999 brood year stocks (Kawana et al. 2000; Urawa et al. 2000). Thermal rings are induced by cooler temperature exposures except for a chum salmon stock at Shizunai Hatchery (Shizunai01chum-tr).

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Table1. Proposed thermal mark releases from Japan for 2001 brood year stocks of chum, pink, and masu salmon.

No	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED
J01-1	2001	2002	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River	fed	fry	1,650,000
J01-2	2001	2002	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River	fed	fry	650,000
J01-3	2001	2002	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Chitose River	Chitose River	fed	fry	30,000,000
J01-4	2001	2002	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River	fed	fry	5,700,000
J01-5	2001	2002	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River	fed	fry	700,000
J01-6	2001	2002	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River	fed	fry	1,800,000
J01-7	2001	2002	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River	fed	fry	2,000,000
J01-8	2001	2002	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River	fed	fry	1,300,000
J01-9	2001	2002	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River	fed	fry	5,000,000
J01-10	2001	2002	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River	fed	fry	800,000
J01-11	2001	2002	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River	fed	fry	1,000,000
J01-12	2001	2002	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Chitose River	Chitose River	fed	fry	30,000
J01-13	2001	2002	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Chitose River	Chitose River	fed	juvenile	40,000
J01-14	2001	2002	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Shiribetsu River	Shiribetsu River	fed	juvenile	40,000
J01-15	2001	2003	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Chitose River	Chitose River	fed	smolt	30,000
J01-16	2001	2003	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Shiribetsu River	Shiribetsu River	fed	smolt	40,000
J01-17	2001	2003	MASU	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Chitose Hatchery	Shizunai River	Shizunai River	fed	smolt	10,000

No	OM ID	RBr CODE	HATCH CODE	GRAPHIC IMAGE PREHATCH	GRAPHIC IMAGE POSTHATCH	MARKING SYSTEM	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J01-1	Tokushibetsu01chum	1:1.2,2.3n-3.3n	2,3n-3nH	I I III III		CHILLER	(1X)24C:24H,(1X)24C:48H,(2X)12C:12H,(1X)12C:36H,(3X)12C:12H	down (8-5°C)	
J01-2	Tokushibetsu01chum-tr	1:1.2,2.3n	2,3nH	I I III		CHILLER	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down (8-5°C)	
J01-3	Chitose01chum	1:1.2,2.5n-3.3n	2,5n-3nH	I I IIIII III		CHILLER	(1X)24C:24H,(1X)24C:48H,(4X)12C:12H,(1X)12C:36H,(3X)12C:12H	down (8-4°C)	inc. TM + Finclips (0.1 million)
J01-4	Shizunai01chum	1:1.2,2.6n	2,6nH	I I IIIIII		CHILLER	(1X)24C:24H,(1X)24C:48H,(6X)12C:12H	down (10-6°C)	
J01-5	Shizunai01chum-tr	1:1.2-2.3	2-3H	I I I I I		CHILLER	(2X)24H:24C,(1X)72H:24C,(2X)24H:24C	up (6-10°C)	
J01-6	Ichani01chum-early	1:1.2,2.4n-3.2n	2,4n-2nH	I I IIII II		CHILLER	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down (8-4°C)	
J01-7	Ichani01chum-mid	1:1.2,2.7n	2,7nH	I I IIIIIII		CHILLER	(1X)24C:24H,(1X)24C:48H,(7X)12C:12H	down (8-4°C)	
J01-8	Ichani01chum-late	1:1.2,2.9n	2,9nH	I I IIIIIIIII		CHILLER	(1X)24C:24H,(1X)24C:48H,(9X)12C:12H	down (8-4°C)	
J01-9	Katagishi01chum	1:1.2,2.4	2,4H	I I I I I I		CHILLER	(1X)12C:12H,(1X),12C:24H,(4X)12C:12H	down (12-8°C)	
J01-10	Tokushibetsu01pink	1:1.2-2.3	2-3H	I I I I I		CHILLER	(1X)24C:24H,(1X)24C:72H,(3X)24C:24H	down (7-4°C)	
J01-11	Ichani01pink	1:1.2,2.2n-3.6n	2,2n-6nH	I I II IIIIII		CHILLER	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:36H,(6X)12C:12H	down (8-4°C)	inc. TM + Finclips (0.1 million)
J01-12	Chitose01masu-f	1:1.2,2.5n-3.3n	2,5n-3nH	I I IIIII III		CHILLER	(1X)24C:24H,(1X)24C:48H,(4X)12C:12H,(1X)12C:36H,(3X)12C:12H	down (8-4°C)	
J01-13	Chitose01masu-j	1:1.2,2.5n-3.3n	2,5n-3nH	I I IIIII III		CHILLER	(1X)24C:24H,(1X)24C:48H,(4X)12C:12H,(1X)12C:36H,(3X)12C:12H	down (8-4°C)	TM + Finclips
J01-14	Shiribetsu01masu-j	1:1.2,2.5n	2,5nH	I I IIIII		CHILLER	(1X)24C:24H,(1X)24C:48H,(5X)12C:12H	down (8-4°C)	TM + Finclips
J01-15	Chitose01masu-s	1:1.2,2.5n-3.3n	2,5n-3nH	I I IIIII III		CHILLER	(1X)24C:24H,(1X)24C:48H,(4X)12C:12H,(1X)12C:36H,(3X)12C:12H	down (8-4°C)	TM + Finclips
J01-16	Shiribetsu01masu-s	1:1.2,2.5n	2,5nH	I I IIIII		CHILLER	(1X)24C:24H,(1X)24C:48H,(5X)12C:12H	down (8-4°C)	TM + Finclips
J01-17	Shizunai01masu-s	1:1.2,2.3n	2,3nH	I I III		CHILLER	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down (8-4°C)	TM + Ribbon Tag