

# **Proposed Otolith Marks for Brood Year 2006 Salmon in Japan**

by

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In Japan, otolith marks are used for migration, growth and survival surveys of juvenile salmon in the coastal waters, and for offshore migration surveys in the Okhotsk Sea, North Pacific Ocean, and Bering Sea. In addition, hatchery origins of maturing adult salmon are determined using thermal marks to evaluate their origins and homing migrations.

The proposed otolith marks for the 2006 brood year salmon include 44 discrete thermal patterns and some ALC (alizarin complexone) patterns (Tables 1-3). We plan to mark approximately 139 million chum, 13.7 million pink, 3.3 million masu, and 30 thousand sockeye salmon at 20 hatcheries (Fig. 1).

The thermal marking pattern is presented as the RBr notation (Munk and Geiger 1998; Hagen 1999) and Hatch code notation (Hagen et al. 2000). As the base mark, two rings in the first band have been adopted to distinguish Japanese chum and pink salmon from other stocks since 1999 brood year stock (Urawa et al. 2000). All thermal rings are induced by cooler temperature exposures.

The ALC marks will be used for chum and pink salmon surveys by Hokkaido Fish Hatchery.

### **References**

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- 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.

Urawa, S., M. Kawana, and T. Ishiguro. 2000. Releases of thermally marked salmon from Japan in 1999 and 2000 with a thermal mark plan for 2000 brood year stocks. (NPAFC Doc. 461) 7 p. National Salmon Resources Center, Fisheries Agency of Japan, Sapporo 062-0922, Japan.

**Table 1.** Proposed otolith mark releases from Japan for 2006 brood year stocks of chum salmon.

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J06-01	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J06-02	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J06-03	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J06-04	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J06-05	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J06-06	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J06-07	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J06-08	ALC	2006	2007	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	HFH	Aioi Hatchery	Abashiri River	Abashiri River
J06-09	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-10	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-11	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-12	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-13	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-14	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-15	ALC	2006	2007	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	HFH	Uebetsu Hatchery	Uebetsu River	Uebetsu River
J06-16	ALC	2006	2007	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	HFH	Shibetsu Hatchery	Shibetsu River	Shibetsu River
J06-17	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J06-18	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J06-19	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	RBr CODE	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
							PREHATCH	POSTHATCH	
J06-01	fed	fry	7,500,000	Chitose06chum-1	1:1.2,2.3-3.2-4.2	2,3-2-2H			CHILLER
J06-02	fed	fry	7,500,000	Chitose06chum-2	1:1.2,2.3-3.2-4.3	2,3-2-3H			CHILLER
J06-03	fed	fry	7,500,000	Chitose06chum-3	1:1.2,2.3-3.5	2,3-5H			CHILLER
J06-04	fed	fry	7,500,000	Chitose06chum-4	1:1.2,2.3-3.6	2,3-6H			CHILLER
J06-05	fed	fry	2,500,000	Teshio06chum-1	1:1.2,2.2	2,2H			CHILLER
J06-06	fed	fry	2,500,000	Teshio06chum-2	1:1.2,2.3n	2,3nH			CHILLER
J06-07	fed	fry	11,100,000	Tokushibetsu06chum	1:1.2,2.4n	2,4nH			CHILLER
J06-08	fed	fry	800,000	Aioi06chum-alc	ALC Mark-single ring	ALC Mark-single ring			
J06-09	fed	fry	1,300,000	Shari06chum-1	1:1.2-2.2-3.2-4.2	2-2-2-2H			CHILLER
J06-10	fed	fry	3,930,000	Shari06chum-2	1:1.2-2.2-3.2-4.3	2-2-2-3H			CHILLER
J06-11	fed	fry	1,300,000	Shari06chum-3	1:1.2-2.2-3.2-4.4	2-2-2-4H			CHILLER
J06-12	fed	fry	2,630,000	Shari06chum-4	1:1.2-2.6	2-6H			CHILLER
J06-13	fed	fry	1,830,000	Shari06chum-5	1:1.2-2.6-3.2	2-6-2H			CHILLER
J06-14	fed	fry	610,000	Shari06chum-6	1:1.2-2.6-3.3	2-6-3H			CHILLER
J06-15	fed	fry	3,000,000	Uebetsu06chum-alc	ALC Mark-single ring	ALC Mark-single ring			
J06-16	fed	fry	500,000	Shibetsu06chum-alc	ALC Mark-single ring	ALC Mark-double ring			
J06-17	fed	fry	2,666,000	Ichani06chum-1	1:1.2-2.7	2-7H			CHILLER
J06-18	fed	fry	2,666,000	Ichani06chum-2	1:1.2-2.8	2-8H			CHILLER
J06-19	fed	fry	2,666,000	Ichani06chum-3	1:1.2-2.9	2-9H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J06-01	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4 °C)	
J06-02	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4 °C)	
J06-03	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(5X)12C:12H	down(8-4 °C)	
J06-04	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(6X)12C:12H	down(8-4 °C)	
J06-05	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(12-8 °C)	
J06-06	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down(12-8 °C)	
J06-07	(1X)24C:24H,(1X)24C:48H,(4X)12C:12H	down(8-5 °C)	
J06-08			include ALC + Finclips
J06-09	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4 °C)	
J06-10	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4 °C)	
J06-11	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(8-4 °C)	
J06-12	(1X)12C:12H,(1X)12C:36H,(6X)12C:12H	down(8-4 °C)	
J06-13	(1X)12C:12H,(1X)12C:36H,(5X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4 °C)	
J06-14	(1X)12C:12H,(1X)12C:36H,(5X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4 °C)	
J06-15			
J06-16			ALC + Finclips
J06-17	(1X)12C:12H,(1X)12C:36H,(7X)12C:12H	down(8-4 °C)	
J06-18	(1X)12C:12H,(1X)12C:36H,(8X)12C:12H	down(8-4 °C)	
J06-19	(1X)12C:12H,(1X)12C:36H,(9X)12C:12H	down(8-4 °C)	

Table 1. Continued.

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J06-20	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Nishibetsu River	Nishibetsu River
J06-21	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Nishibetsu River	Nishibetsu River
J06-22	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Nishibetsu River	Nishibetsu River
J06-23	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tsurui Hatchery	Kushiro River	Kushiro River
J06-24	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tsurui Hatchery	Kushiro River	Kushiro River
J06-25	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tokachi Hatchery	Tokachi River	Tokachi River
J06-26	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tokachi Hatchery	Tokachi River	Tokachi River
J06-27	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tokachi Hatchery	Tokachi River	Tokachi River
J06-28	ALC	2006	2007	CHUM	JAPAN	HOKKAIDO	East Pacific coast	HFH	Makubetsu Hatchery	Tokachi River	Tokachi River
J06-29	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J06-30	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J06-31	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J06-32	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River
J06-33	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River
J06-34	TM	2006	2007	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River
J06-35	TM	2006	2007	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J06-36	TM	2006	2007	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J06-37	TM	2006	2007	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J06-38	TM	2006	2007	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	Rb CODE	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
							PREHATCH	POSTHATCH	
J06-20	fed	fry	8,333,000	Nijibetsu06chum-1	1:1.2-2.4-3.2	2-4-2H			CHILLER
J06-21	fed	fry	8,333,000	Nijibetsu06chum-2	1:1.2-2.4-3.3	2-4-3H			CHILLER
J06-22	fed	fry	8,333,000	Nijibetsu06chum-3	1:1.2-2.4-3.4	2-4-4H			CHILLER
J06-23	fed	fry	4,550,000	Tsurui06chum-1	1:1.2-2.2-3.3-4.2	2-2-3-2H			CHILLER
J06-24	fed	fry	4,550,000	Tsurui06chum-2	1:1.2-2.2-3.3-4.3	2-2-3-3H			CHILLER
J06-25	fed	fry	5,100,000	Tokachi06chum-1	1:1.2-2.5-3.2	2-5-2H			CHILLER
J06-26	fed	fry	5,100,000	Tokachi06chum-2	1:1.2-2.5-3.3	2-5-3H			CHILLER
J06-27	fed	fry	5,100,000	Tokachi06chum-3	1:1.2-2.5-3.4	2-5-4H			CHILLER
J06-28	fed	fry	500,000	Makubetsu06chum-alc	ALC Mark-single ring	ALC Mark-single ring			
J06-29	fed	fry	2,133,000	Shizunai06chum-1	1:1.2-2.3-3.2	2-3-2H			CHILLER
J06-30	fed	fry	2,133,000	Shizunai06chum-2	1:1.2-2.3-3.3	2-3-3H			CHILLER
J06-31	fed	fry	2,133,000	Shizunai06chum-3	1:1.2-2.3-3.4	2-3-4H			CHILLER
J06-32	fed	fry	2,500,000	Yurappu06chum-1	1:1.2-2.2-3.3	2-2-3H			CHILLER
J06-33	fed	fry	2,500,000	Yurappu06chum-2	1:1.2-2.2-3.4	2-2-4H			CHILLER
J06-34	fed	fry	2,500,000	Yurappu06chum-3	1:1.2-2.2-3.5	2-2-5H			CHILLER
J06-35	fed	fry	2,000,000	Katagishi06chum-1	1:1.2,2,3	2,3H			CHILLER
J06-36	fed	fry	1,000,000	Katagishi06chum-2	1:1.2,2,4	2,4H			CHILLER
J06-37	fed	fry	1,000,000	Katagishi06chum-3	1:1.2,2,5	2,5H			CHILLER
J06-38	fed	fry	1,000,000	Katagishi06chum-4	1:1.2-2,2,3,2	2-2,2H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J06-20	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(9-5 °C)	
J06-21	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(9-5 °C)	
J06-22	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(9-5 °C)	
J06-23	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4 °C)	
J06-24	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4 °C)	
J06-25	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(9-5 °C)	
J06-26	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(9-5 °C)	
J06-27	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(9-5 °C)	
J06-28			ALC + Finclips
J06-29	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(10-6 °C)	
J06-30	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(10-6 °C)	
J06-31	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(10-6 °C)	
J06-32	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4 °C)	
J06-33	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(8-4 °C)	
J06-34	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(5X)12C:12H	down(8-4 °C)	
J06-35	(1X)12C:12H,(1X)12C:24H,(3X)12C:12H	down(12-8 °C)	
J06-36	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H	down(12-8 °C)	
J06-37	(1X)12C:12H,(1X)12C:24H,(5X)12C:12H	down(12-8 °C)	
J06-38	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:24H,(2X)12C:12H	down(12-8 °C)	

**Table2.** Proposed otolith mark releases from Japan for 2006 brood year stocks of pink salmon.

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J06-39	TM	2006	2007	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J06-40	TM	2006	2007	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Kitami Hatchery	Tokoro River	Tokoro River
J06-41	ALC	2006	2007	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	HFH	Abashiri Hatchery	Abashiri River	Abashiri River
J06-42	TM	2006	2007	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J06-43	ALC	2006	2007	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	HFH	Touhoro Hatchery	Touhoro River	Touhoro River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	RBr CODE	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
							PREHATCH	POSTHATCH	
J06-39	fed	fry	1,700,000	Tokushibetsu06pink	1:1.2-2.3	2-3H			CHILLER
J06-40	fed	fry	1,000,000	Tokoro06pink	1:1.2,2.3n-3.2n	2,3n-2nH			CHILLER
J06-41	fed	fry	2,500,000	Abashiri06pink-alc	ALC Mark-single ring	ALC Mark-single ring			
J06-42	fed	fry	4,500,000	Ichani06pink	1:1.2,2.4	2,4H			CHILLER
J06-43	fed	fry	4,000,000	Touhoro06pink-alc	ALC Mark-single ring	ALC Mark-single ring			

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J06-39	(1X)24C:24H,(1X)924C:72H,(3X)24C:24H	down(7-4 °C)	
J06-40	(1X)24C:24H,(1X)24C:48H,(2X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(12-8 °C)	
J06-41			
J06-42	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4 °C)	
J06-43			

**Table3.** Proposed otolith mark releases from Japan for 2006 brood year stocks of masu salmon.

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J06-44	TM	2006	2007	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetu Hatchery	Shiribetu River	Shubuto River
J06-45	TM	2006	2007	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetu Hatchery	Shiribetu River	Shiribetu River
J06-46	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetu Hatchery	Shiribetu River	Shiribetu River
J06-47	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetu Hatchery	Shiribetu River	Shiribetu River
J06-48	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Shiribetu River	Shiribetu River
J06-49	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Shiribetu River	Shiribetu River
J06-50	TM	2006	2007	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J06-51	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J06-52	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J06-53	TM	2006	2007	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J06-54	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J06-55	TM	2006	2007	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-56	TM	2006	2007	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-57	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-58	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J06-59	TM	2006	2007	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J06-60	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J06-61	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J06-62	TM	2006	2007	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Shibetsu River	Shibetsu River
J06-63	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Shibetsu River	Shibetsu River
J06-64	TM	2006	2008	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Shibetsu River	Shibetsu River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	RBr CODE	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
							PREHATCH	POSTHATCH	
J06-44	fed	fry	500,000	Shubuto06masu-f	1:1.2.2.2	2,2H			CHILLER
J06-45	fed	fry	760,000	Shiribetsu06masu-r-f	1:1.2.2.2	2,2H			CHILLER
J06-46	fed	juvenile	160,000	Shiribetsu06masu-r-j	1:1.2.2.2	2,2H			CHILLER
J06-47	fed	smolt	200,000	Shiribetsu06masu-r-s	1:1.2.2.2	2,2H			CHILLER
J06-48	fed	juvenile	60,000	Shiribetsu06masu-c-j	1:1.2.2.2,3,2	2,2,2H			CHILLER
J06-49	fed	smolt	20,000	Shiribetsu06masu-c-s	1:1.2.2.2,3,2	2,2,2H			CHILLER
J06-50	fed	fry	30,000	Chitose06masu-f	1:1.2.2.3	2,3H			CHILLER
J06-51	fed	juvenile	40,000	Chitose06masu-j	1:1.2.2.3	2,3H			CHILLER
J06-52	fed	smolt	30,000	Chitose06masu-s	1:1.2.2.3	2,3H			CHILLER
J06-53	fed	fry	400,000	Tokushibetsu06masu-f	1:1.2.2.3n	2,3nH			CHILLER
J06-54	fed	juvenile	100,000	Tokushibetsu06masu-j	1:1.2.2.3n	2,3nH			CHILLER
J06-55	fed	fry	480,000	Shari06masu-f	1:1.6	6H			CHILLER
J06-56	unfed	egg	-	Shari06masu-e	1:1.4	4H			CHILLER
J06-57	fed	juvenile	100,000	Shari06masu-j	1:1.6	6H			CHILLER
J06-58	fed	smolt	100,000	Shari06masu-s	1:1.6	6H			CHILLER
J06-59	fed	fry	40,000	Ichani06masu-f	1:1.2.2.4	2,4H			CHILLER
J06-60	fed	juvenile	40,000	Ichani06masu-j	1:1.2.2.4	2,4H			CHILLER
J06-61	fed	smolt	30,000	Ichani06masu-s	1:1.2.2.4	2,4H			CHILLER
J06-62	fed	fry	110,000	Shibetsu06masu-f	1:1.2.2.4	2,4H			CHILLER
J06-63	fed	juvenile	50,000	Shibetsu06masu-j	1:1.2.2.4	2,4H			CHILLER
J06-64	fed	smolt	30,000	Shibetsu06masu-s	1:1.2.2.4	2,4H			CHILLER

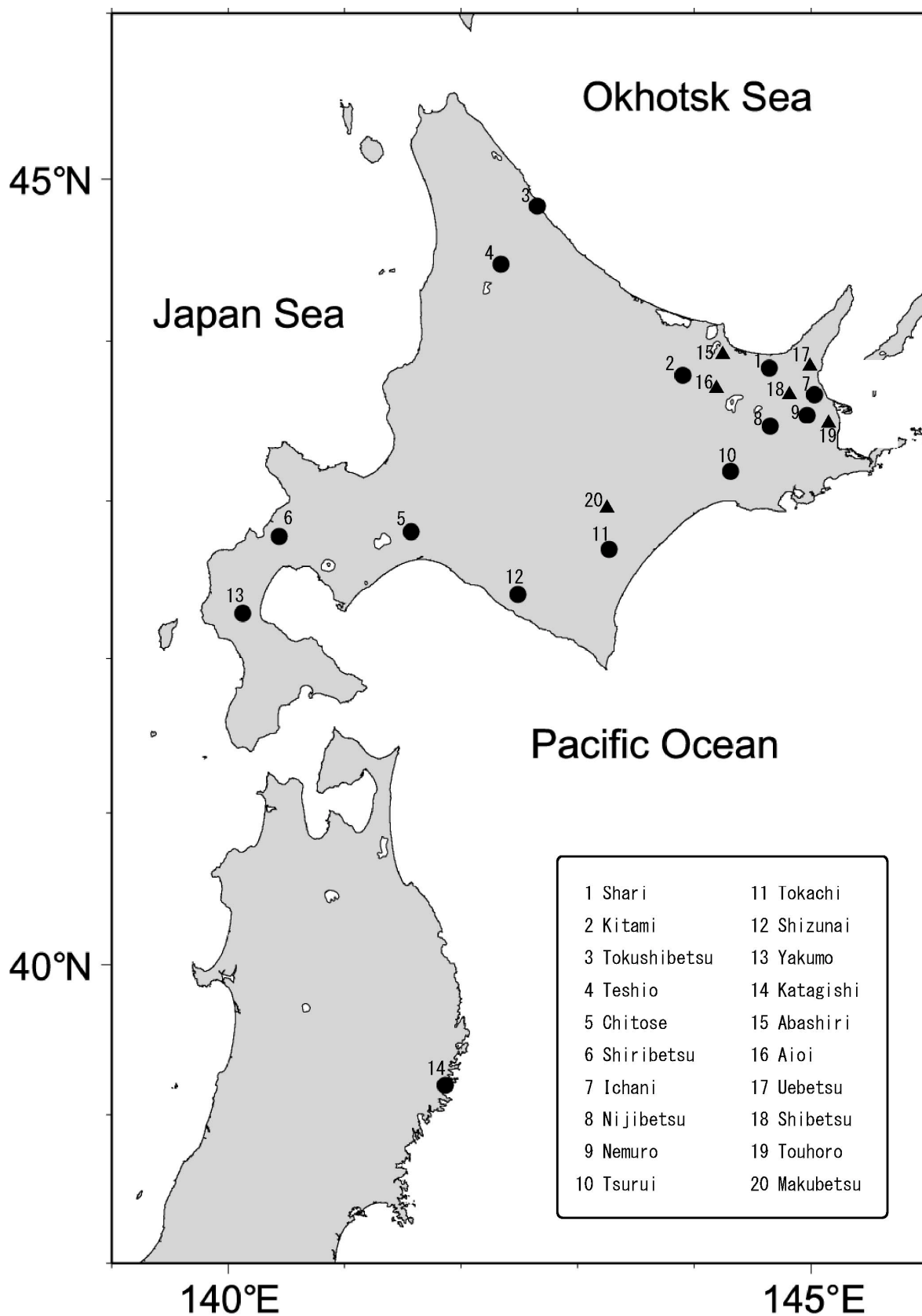
No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J06-44	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	
J06-45	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	
J06-46	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	TM + Finclips
J06-47	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	TM + Finclips
J06-48	(1X)24C:24H,(1X)24C:48H,(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(8-4°C)	TM + Finclips
J06-49	(1X)24C:24H,(1X)24C:48H,(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(8-4°C)	TM + Finclips
J06-50	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	
J06-51	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	TM + Finclips
J06-52	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	TM + Finclips
J06-53	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down(8-4°C)	
J06-54	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down(8-4°C)	TM + Finclips
J06-55	(6X)24C:24H	down(8-4°C)	
J06-56	(4X)24C:24H	down(8-4°C)	
J06-57	(6X)24C:24H	down(8-4°C)	TM + Finclips
J06-58	(6X)24C:24H	down(8-4°C)	TM + Finclips
J06-59	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	
J06-60	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips
J06-61	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips
J06-62	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	
J06-63	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips
J06-64	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips

**Table 4.** Proposed otolith mark releases from Japan for 2006 brood year stocks of sockeye salmon.

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J06-65	TM	2006	2007	SOCKEYE	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J06-66	TM	2006	2007	SOCKEYE	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J06-67	TM	2006	2007	SOCKEYE	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	RBr CODE	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
							PREHATCH	POSTHATCH	
J06-65	fed	smolt	10,000	Shizunai06sockeye-1	1:1.2.2.6	2,6H			CHILLER
J06-66	fed	smolt	10,000	Shizunai06sockeye-2	1:1.2.2.7	2,7H			CHILLER
J06-67	fed	smolt	10,000	Shizunai06sockeye-3	1:1.7.2.9	2,9H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J06-65	(1X)24C:24H,(1X)24C:48H,(6X)24C:24H	down(10-6°C)	
J06-66	(1X)24C:24H,(1X)24C:48H,(7X)24C:24H	down(10-6°C)	
J06-67	(1X)24C:24H,(1X)24C:48H,(9X)24C:24H	down(10-6°C)	



**Fig. 1.** Locations of hatcheries where brood year 2006 salmon will be thermally marked (closed circles) or marked with ALC (closed triangles).