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# **Proposed Otolith Marks for Brood Year 2008 Salmon in Japan**

by

Masaya Takahashi and Tadayoshi Tojima

*National Salmon Resources Center, Fisheries Research Agency  
2-2 Nakanoshima, Toyohira-ku, Sapporo 062-0922, Japan*

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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 adults are determined using thermal marks to evaluate their homing migrations.

The proposed otolith marks for the 2008 brood year salmon include 54 discrete thermal patterns and one ALC (alizarin complexone) patterns (Tables 1-4). We plan to mark approximately 153 million chum, 22.6 million pink, 3.2 million masu, and 30 thousand sockeye salmon at 18 hatcheries (Fig. 1).

The thermal marking pattern is presented as the Hatch code notation (Hagen et al. 2000; Josephson et al. 2006). 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 salmon surveys by Hokkaido Fish Hatchery.

## **References**

- Hagen, P., H.J. Geiger, E.C. Volk, and J.J. Grimm. 2000. Thermal mark patterns applied to salmon from Alaska, Washington and Oregon for brood year 1999 and some proposed marks for brood year 2000. (NPAFC Doc. 463 rev.1). 8 p. Alaska Dept. Fish and Game, Juneau Alaska 99801-5526, USA.
- Josephson, R., B.A. Agler, K.F. Van Kirk, and D.S. Oxman 2006. A proposal to simplify the thermal mark code notation. (NPAFC Doc. 944). 4 p. Alaska Dept. Fish and Game, Juneau Alaska. 99801-5526, 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 2008 brood year stocks of chum salmon. Red portions were updated on September 2, 2008.

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J08-01	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J08-02	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J08-03	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J08-04	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J08-05	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J08-06	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J08-07	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J08-08	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J08-09	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J08-10	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-11	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-12	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-13	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-14	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-15	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-16	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-17	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J08-01	fed	fry	19,500,000	Ishikari08chum-1	2,3-2-2H			CHILLER
J08-02	fed	fry	6,000,000	Ishikari08chum-2	2,3-2-3H			CHILLER
J08-03	fed	fry	3,000,000	Ishikari08chum-3	2,3-5H			CHILLER
J08-04	fed	fry	1,500,000	Ishikari08chum-4	2,3-6H			CHILLER
J08-05	fed	fry	2,900,000	Teshio08chum-1	2,2H			CHILLER
J08-06	fed	fry	700,000	Teshio08chum-2	2,3nH			CHILLER
J08-07	fed	fry	700,000	Teshio08chum-3	2n-3H			CHILLER
J08-08	fed	fry	700,000	Teshio08chum-4	2n-4H			CHILLER
J08-09	fed	fry	11,100,000	Tokushibetsu08chum	2,4nH			CHILLER
J08-10	fed	fry	2,000,000	Shari08chum-1	2-2-2-2H			CHILLER
J08-11	fed	fry	1,300,000	Shari08chum-2	2-2-2-3H			CHILLER
J08-12	fed	fry	2,600,000	Shari08chum-3	2-2-2-4H			CHILLER
J08-13	fed	fry	1,300,000	Shari08chum-4	2-6H			CHILLER
J08-14	fed	fry	1,800,000	Shari08chum-5	2-6-2H			CHILLER
J08-15	fed	fry	1,800,000	Shari08chum-6	2-6-3H			CHILLER
J08-16	fed	fry	800,000	Shari08chum-7	2-2-3-2H			CHILLER
J08-17	fed	fry	600,000	Ichani08chum-1	2-7H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J08-01	(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)	
J08-02	(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)	
J08-03	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(5X)12C:12H	down(8-4°C)	
J08-04	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(6X)12C:12H	down(8-4°C)	
J08-05	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(12-8°C)	
J08-06	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down(12-8°C)	
J08-07	(1X)12C:12H,(1X)12C:36H,(3X)24C:24H	down(12-8°C)	
J08-08	(1X)12C:12H,(1X)12C:36H,(4X)24C:24H	down(12-8°C)	
J08-09	(1X)24C:24H,(1X)24C:48H,(4X)12C:12H	down(8-5°C)	
J08-10	(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)	
J08-11	(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)	
J08-12	(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)	
J08-13	(1X)12C:12H,(1X)12C:36H,(6X)12C:12H	down(8-4°C)	
J08-14	(1X)12C:12H,(1X)12C:36H,(5X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4°C)	
J08-15	(1X)12C:12H,(1X)12C:36H,(5X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4°C)	
J08-16	(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)	
J08-17	(1X)12C:12H,(1X)12C:36H,(7X)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
J08-18	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J08-19	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J08-20	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J08-21	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J08-22	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J08-23	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J08-24	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Nishibetsu River	Nishibetsu River
J08-25	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tsurui Hatchery	Kushiro River	Kushiro River
J08-26	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tokachi Hatchery	Tokachi River	Tokachi River
J08-27	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tokachi Hatchery	Tokachi River	Tokachi River
J08-28	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J08-29	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J08-30	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J08-31	ALC	2008	2009	CHUM	JAPAN	HOKKAIDO	West Pacific coast	HFH	Hidakahorobetsu Hatchery	Hidakahorobetsu River	Hidakahorobetsu River
J08-32	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River
J08-33	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River
J08-34	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J08-18	fed	fry	1,300,000	Ichani08chum-2	2-8H			CHILLER
J08-19	fed	fry	600,000	Ichani08chum-3	2-9H			CHILLER
J08-20	fed	fry	1,800,000	Ichani08chum-4	2-4-2H			CHILLER
J08-21	fed	fry	1,200,000	Ichani08chum-5	2-4-3H			CHILLER
J08-22	fed	fry	1,300,000	Ichani08chum-6	2-4-4H			CHILLER
J08-23	fed	fry	1,200,000	Ichani08chum-7	2-5-2H			CHILLER
J08-24	fed	fry	25,000,000	Nishibetsu08chum	2,6nH			CHILLER
J08-25	fed	fry	9,100,000	Kushiro08chum	2-2-3-3H			CHILLER
J08-26	fed	fry	12,400,000	Tokachi08chum-1	2-5-3H			CHILLER
J08-27	fed	fry	2,900,000	Tokachi08chum-2	2-5-4H			CHILLER
J08-28	fed	fry	670,000	Shizunai08chum-1	2-3-2H			CHILLER
J08-29	fed	fry	2,870,000	Shizunai08chum-2	2-3-3H			CHILLER
J08-30	fed	fry	2,860,000	Shizunai08chum-3	2-3-4H			CHILLER
J08-31	fed	fry	1,000,000	Hidakahorobetsu08chum-alc	ALC Mark-single ring			
J08-32	fed	fry	6,500,000	Yurappu08chum-1	2-2-3H			CHILLER
J08-33	fed	fry	500,000	Yurappu08chum-2	2-2-4H			CHILLER
J08-34	fed	fry	500,000	Yurappu08chum-3	2-2-5H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J08-18	(1X)12C:12H,(1X)12C:36H,(8X)12C:12H	down(8-4°C)	
J08-19	(1X)12C:12H,(1X)12C:36H,(9X)12C:12H	down(8-4°C)	
J08-20	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4°C)	
J08-21	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4°C)	
J08-22	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(8-4°C)	
J08-23	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4°C)	
J08-24	(1X)24C:24H,(1X)24C:48H,(6X)12C:12H	down(9-5°C)	
J08-25	(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)	
J08-26	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(9-5°C)	
J08-27	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(9-5°C)	
J08-28	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(10-6°C)	
J08-29	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(10-6°C)	
J08-30	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(10-6°C)	
J08-31			ALC + Finclips
J08-32	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4°C)	
J08-33	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(8-4°C)	
J08-34	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(5X)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
J08-35	TM	2008	2009	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yurappu Hatchery	Yurappu River	Yurappu River
J08-36	TM	2008	2009	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J08-37	TM	2008	2009	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J08-38	TM	2008	2009	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J08-39	TM	2008	2009	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J08-40	TM	2008	2009	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Tarou Hatchery	Tarou River	Tarou River
J08-41	TM	2008	2009	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Tarou Hatchery	Tarou River	Tarou River
J08-42	TM	2008	2009	CHUM	JAPAN	HONSHU	Japan Sea coast	NASREC	Masukawa Hatchery	Gakkou River	Gakkou River
J08-43	TM	2008	2009	CHUM	JAPAN	HONSHU	Japan Sea coast	NASREC	Masukawa Hatchery	Gakkou River	Gakkou River
J08-44	TM	2008	2009	CHUM	JAPAN	HONSHU	Japan Sea coast	NASREC	Masukawa Hatchery	Gakkou River	Gakkou River
J08-45	TM	2008	2009	CHUM	JAPAN	HONSHU	Japan Sea coast	NASREC	Masukawa Hatchery	Gakkou River	Gakkou River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J08-35	fed	fry	2,000,000	Yurappu08chum-ALC	ALC Mark-single ring			
J08-36	fed	fry	2,000,000	Katagishi08chum-1	2,3H			CHILLER
J08-37	fed	fry	1,000,000	Katagishi08chum-2	2,4H			CHILLER
J08-38	fed	fry	1,000,000	Katagishi08chum-3	2,5H			CHILLER
J08-39	fed	fry	1,000,000	Katagishi08chum-4	2-2,2H			CHILLER
J08-40	fed	fry	2,000,000	Tarou08chum-1	2,2nH			CHILLER
J08-41	fed	fry	2,000,000	Tarou08chum-2	2n-2H			CHILLER
J08-42	fed	fry	4,000,000	Gakkou08chum-1	2-1-2H			CHILLER
J08-43	fed	fry	1,000,000	Gakkou08chum-2	2-1-3H			CHILLER
J08-44	fed	fry	3,000,000	Gakkou08chum-3	2-1-4H			CHILLER
J08-45	fed	fry	4,000,000	Gakkou08chum-4	2-1-5H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J08-35			ALC + Finclips
J08-36	(1X)12C:12H,(1X)12C:24H,(3X)12C:12H	down(12-8°C)	
J08-37	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H	down(12-8°C)	
J08-38	(1X)12C:12H,(1X)12C:24H,(5X)12C:12H	down(12-8°C)	
J08-39	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:24H,(2X)12C:12H	down(12-8°C)	
J08-40	(1X)24C:24H,(1X)24C:48H,(2X)12C:12H	down(12-8°C)	
J08-41	(1X)12C:12H,(1X)12C:36H,(2X)24C:24H	down(12-8°C)	
J08-42	(1X)12C:12H,(2X)12C:36H,(2X)12C:12H	down(9-5°C)	
J08-43	(1X)12C:12H,(2X)12C:36H,(3X)12C:12H	down(9-5°C)	
J08-44	(1X)12C:12H,(2X)12C:36H,(4X)12C:12H	down(9-5°C)	
J08-45	(1X)12C:12H,(2X)12C:36H,(5X)12C:12H	down(9-5°C)	

**Table 2.** Proposed otolith mark releases from Japan for 2008 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
J08-46	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu Rive
J08-47	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Kitamihorobetsu Riv
J08-48	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-49	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Kitami Hatchery	Tokoro River	Tokoro River
J08-50	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Kitami Hatchery	Tokoro River	Tokoro River
J08-51	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Sashirui River	Sashirui River
J08-52	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Rausu River	Rausu River
J08-53	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Shunkarikotan River	Shunkarikotan Rive
J08-54	TM	2008	2009	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J08-55	TM	2008	2009	PINK	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tsurui Hatchery	Kushiro River	Kushiro River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J08-46	fed	fry	1,700,000	Tokushibetsu08pink	2-3H			CHILLER
J08-47	fed	fry	2,000,000	Kitamihorobetsu08pink	2,3nH			CHILLER
J08-48	fed	fry	4,400,000	Shari08pink	2,3nH			CHILLER
J08-49	fed	fry	500,000	Tokoro08pink-1	2,3n-2nH			CHILLER
J08-50	fed	fry	500,000	Tokoro08pink-2	2,2n-3nH			CHILLER
J08-51	fed	fry	1,000,000	Sashirui08pink	2,3nH			CHILLER
J08-52	fed	fry	1,000,000	Rausu08pink	2,3nH			CHILLER
J08-53	fed	fry	2,000,000	Shunkarikotan08pink	2,3nH			CHILLER
J08-54	fed	fry	4,500,000	Ichani08pink	2,4H			CHILLER
J08-55	fed	fry	5,000,000	Kushiro08pink	2,3nH			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J08-46	(1X)24C:24H,(1X)924C:72H,(3X)24C:24H	down(7-4 °C)	
J08-47	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(7-4 °C)	
J08-48	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4 °C)	
J08-49	(1X)24C:24H,(1X)24C:48H,(2X)12C:12H	down(12-8 °C)	
J08-50	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(12-8 °C)	
J08-51	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(9-5 °C)	
J08-52	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(9-5 °C)	
J08-53	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(9-5 °C)	
J08-54	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4 °C)	
J08-55	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4 °C)	

**Table 3.** Proposed otolith mark releases from Japan for 2008 brood year stocks of masu salmon. Red portions were updated on September 2, 2008.

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J08-56	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetsu Hatchery	Shiribetsu River	Shubuto River
J08-57	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
J08-58	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
J08-59	TM	2008	2010	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
J08-60	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Yakumo Hatchery	Shiribetsu River	Shiribetsu River
J08-61	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Yakumo Hatchery	Shiribetsu River	Shiribetsu River
J08-62	TM	2008	2010	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Yakumo Hatchery	Shiribetsu River	Shiribetsu River
J08-63	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J08-64	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J08-65	TM	2008	2010	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J08-66	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J08-67	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J08-56	unfed	fry	500,000	Shubuto08masu-f	3H			CHILLER
J08-57	fed	fry	640,000	Shiribetsu08masu-r-f	2,2H			CHILLER
J08-58	fed	juvenile	110,000	Shiribetsu08masu-r-j	2,2H			CHILLER
J08-59	fed	smolt	110,000	Shiribetsu08masu-r-s	2,2H			CHILLER
J08-60	fed	fry	120,000	Shiribetsu08masu-y-f	2,2H			CHILLER
J08-61	fed	juvenile	110,000	Shiribetsu08masu-y-j	2,2H			CHILLER
J08-62	fed	smolt	110,000	Shiribetsu08masu-y-s	2,2H			CHILLER
J08-63	fed	fry	30,000	Chitose08masu-f	2,3H			CHILLER
J08-64	fed	juvenile	40,000	Chitose08masu-j	2,3H			CHILLER
J08-65	fed	smolt	30,000	Chitose08masu-s	2,3H			CHILLER
J08-66	fed	fry	400,000	Tokushibetsu08masu-f	2,3nH			CHILLER
J08-67	fed	juvenile	100,000	Tokushibetsu08masu-j	2,3nH			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J08-56	(3X)24C:24H	down(10-6°C)	
J08-57	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	
J08-58	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	TM + Finclips
J08-59	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	TM + Finclips
J08-60	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(8-4°C)	
J08-61	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(8-4°C)	TM + Finclips
J08-62	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(8-4°C)	TM + Finclips
J08-63	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	
J08-64	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	TM + Finclips
J08-65	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	TM + Finclips
J08-66	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down(8-4°C)	
J08-67	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down(8-4°C)	TM + Finclips

**Table3. Continued.**

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J08-68	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-69	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-70	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-71	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-72	TM	2008	2010	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J08-73	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J08-74	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J08-75	TM	2008	2010	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J08-76	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Shibetsu River	Shibetsu River
J08-77	TM	2008	2009	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Shibetsu River	Shibetsu River
J08-78	TM	2008	2010	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Shibetsu River	Shibetsu River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J08-68	fed	fry	400,000	Shari08masu-f	6H			CHILLER
J08-69	unfed	egg	-	Shari08masu-e-1	4H			CHILLER
J08-70	unfed	egg	-	Shari08masu-e-2	3,2nH			CHILLER
J08-71	fed	juvenile	100,000	Shari08masu-j	6H			CHILLER
J08-72	fed	smolt	100,000	Shari08masu-s	6H			CHILLER
J08-73	fed	fry	40,000	Ichani08masu-f	2,5H			CHILLER
J08-74	fed	juvenile	30,000	Ichani08masu-j	2,5H			CHILLER
J08-75	fed	smolt	30,000	Ichani08masu-s	2,5H			CHILLER
J08-76	fed	fry	110,000	Shibetsu08masu-f	2,4H			CHILLER
J08-77	fed	juvenile	60,000	Shibetsu08masu-j	2,4H			CHILLER
J08-78	fed	smolt	30,000	Shibetsu08masu-s	2,4H			CHILLER

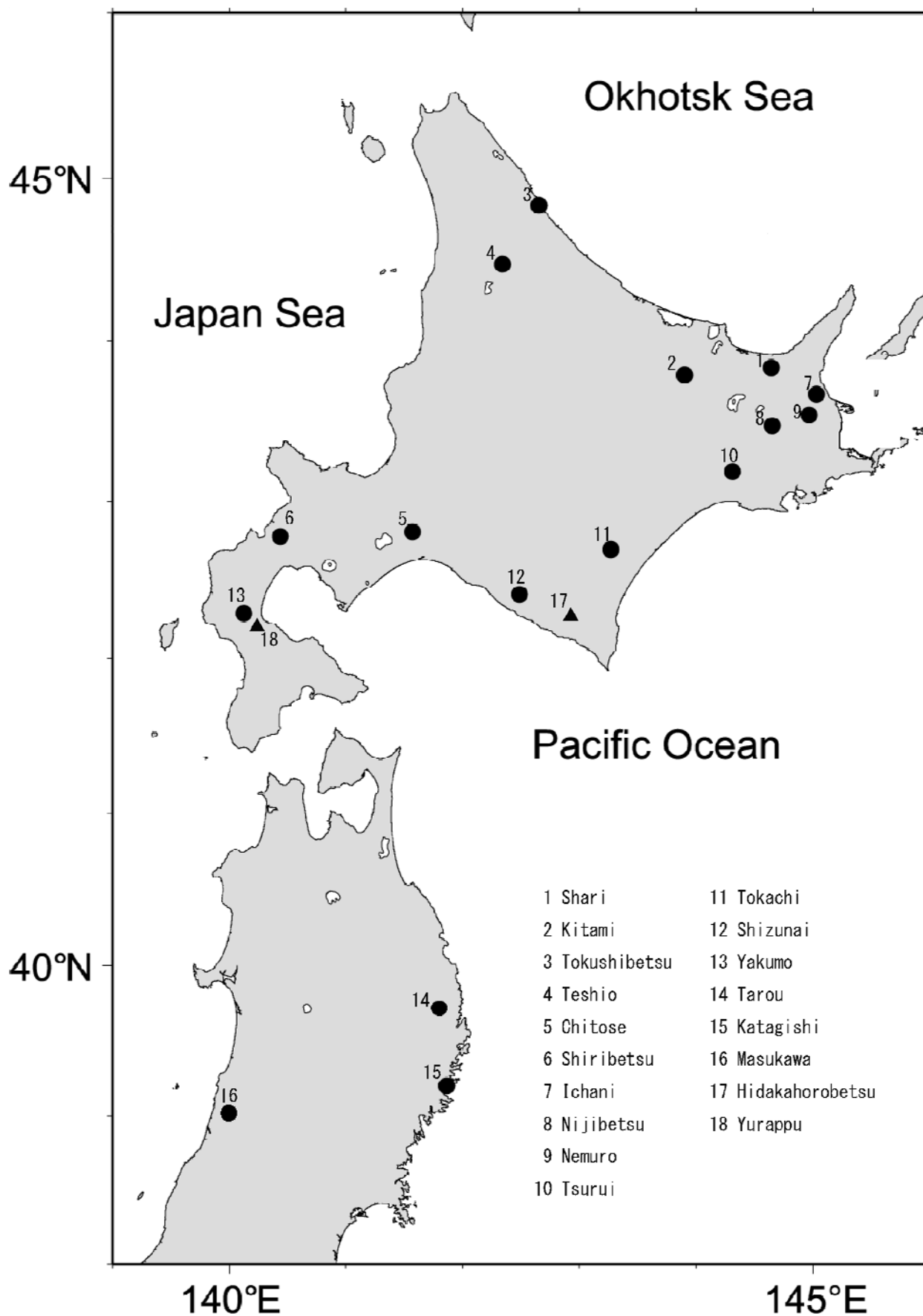
No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J08-68	(6X)24C:24H	down(8-4°C)	
J08-69	(4X)24C:24H	down(8-4°C)	
J08-70	(2X)24C:24H,(1X)24C:48H,(2X)12C:12H	down(8-4°C)	
J08-71	(6X)24C:24H	down(8-4°C)	TM + Finclips
J08-72	(6X)24C:24H	down(8-4°C)	TM + Finclips
J08-73	(1X)24C:24H,(1X)24C:48H,(5X)24C:24H	down(8-4°C)	
J08-74	(1X)24C:24H,(1X)24C:48H,(5X)24C:24H	down(8-4°C)	TM + Finclips
J08-75	(1X)24C:24H,(1X)24C:48H,(5X)24C:24H	down(8-4°C)	TM + Finclips
J08-76	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	
J08-77	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips
J08-78	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips

**Table 4.** Proposed otolith mark releases from Japan for 2008 brood year stocks of sockeye salmon. Red portions were updated on September 2, 2008.

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J08-79	TM	2008	2009	SOCKEYE	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Tsurui Hatchery	Kushiro River	Kushiro River
J08-80	TM	2008	2009	SOCKEYE	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J08-81	TM	2008	2009	SOCKEYE	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Chitose Hatchery	Abira River	Abira River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J08-79	fed	smolt	10,000	Kushiro08sockeye	2,9H			CHILLER
J08-80	fed	smolt	10,000	Shizunai08sockeye	2,7H			CHILLER
J08-81	fed	smolt	10,000	Abira08sockeye	2,6H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J08-79	(1X)24C:24H,(1X)24C:48H,(9X)24C:24H	down(10-6 °C)	
J08-80	(1X)24C:24H,(1X)24C:48H,(7X)24C:24H	down(10-6 °C)	
J08-81	(1X)24C:24H,(1X)24C:48H,(6X)24C:24H	down(10-6 °C)	



**Fig. 1.** Locations of hatcheries where brood year 2008 salmon will be thermally marked (closed circles) or marked with ALC (closed triangles).