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## **Proposed Otolith Marks for Brood Year 2007 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 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 2007 brood year salmon include 50 discrete thermal patterns and some ALC (alizarin complexone) patterns (Tables 1-3). We plan to mark approximately 143 million chum, 29.1 million pink, 3.2 million masu, and 30 thousand sockeye salmon at 21 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 and pink 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). 8p. 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). 4p. 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.

**Table1.** Proposed otolith mark releases from Japan for 2007 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
J07-01	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J07-02	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J07-03	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J07-04	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J07-05	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J07-06	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J07-07	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J07-08	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Teshio Hatchery	Teshio River	Teshio River
J07-09	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J07-10	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-11	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-12	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-13	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-14	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-15	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-16	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-17	ALC	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	HFH	Uebetsu Hatchery	Uebetsu River	Uebetsu River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J07-01	fed	fry	19,600,000	Ishikari07chum-1	2,3-2-2H			CHILLER
J07-02	fed	fry	4,400,000	Ishikari07chum-2	2,3-2-3H			CHILLER
J07-03	fed	fry	4,500,000	Ishikari07chum-3	2,3-5H			CHILLER
J07-04	fed	fry	1,500,000	Ishikari07chum-4	2,3-6H			CHILLER
J07-05	fed	fry	2,900,000	Teshio07chum-1	2,2H			CHILLER
J07-06	fed	fry	700,000	Teshio07chum-2	2,3nH			CHILLER
J07-07	fed	fry	700,000	Teshio07chum-3	2n-3H			CHILLER
J07-08	fed	fry	700,000	Teshio07chum-4	2n-4H			CHILLER
J07-09	fed	fry	11,100,000	Tokushibetsu07chum	2,4nH			CHILLER
J07-10	fed	fry	2,000,000	Shari07chum-1	2-2-2-2H			CHILLER
J07-11	fed	fry	1,300,000	Shari07chum-2	2-2-2-3H			CHILLER
J07-12	fed	fry	2,600,000	Shari07chum-3	2-2-2-4H			CHILLER
J07-13	fed	fry	1,300,000	Shari07chum-4	2-6H			CHILLER
J07-14	fed	fry	1,800,000	Shari07chum-5	2-6-2H			CHILLER
J07-15	fed	fry	1,800,000	Shari07chum-6	2-6-3H			CHILLER
J07-16	fed	fry	800,000	Shari07chum-7	2-2-3-2H			CHILLER
J07-17	fed	fry	3,000,000	Uebetsu07chum-alc	ALC Mark-single ring			

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J07-01	(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)	
J07-02	(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)	
J07-03	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(5X)12C:12H	down(8-4°C)	
J07-04	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(6X)12C:12H	down(8-4°C)	
J07-05	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(12-8°C)	
J07-06	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down(12-8°C)	
J07-07	(1X)12C:12H,(1X)12C:36H,(3X)24C:24H	down(12-8°C)	
J07-08	(1X)12C:12H,(1X)12C:36H,(4X)24C:24H	down(12-8°C)	
J07-09	(1X)24C:24H,(1X)24C:48H,(4X)12C:12H	down(8-5°C)	
J07-10	(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)	
J07-11	(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)	
J07-12	(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)	
J07-13	(1X)12C:12H,(1X)12C:36H,(6X)12C:12H	down(8-4°C)	
J07-14	(1X)12C:12H,(1X)12C:36H,(5X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4°C)	
J07-15	(1X)12C:12H,(1X)12C:36H,(5X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4°C)	
J07-16	(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)	
J07-17			

**Table 1. Continued.**

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J07-18	ALC	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	HFH	Shibetsu Hatchery	Shibetsu River	Shibetsu River
J07-19	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J07-20	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J07-21	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J07-22	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J07-23	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J07-24	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J07-25	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J07-26	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Nishibetsu River	Nishibetsu River
J07-27	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tsurui Hatchery	Kushiro River	Kushiro River
J07-28	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tokachi Hatchery	Tokachi River	Tokachi River
J07-29	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	East Pacific coast	NASREC	Tokachi Hatchery	Tokachi River	Tokachi River
J07-30	ALC	2007	2008	CHUM	JAPAN	HOKKAIDO	East Pacific coast	HFH	Makubetsu Hatchery	Tokachi River	Tokachi River
J07-31	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J07-32	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J07-33	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J07-34	ALC	2007	2008	CHUM	JAPAN	HOKKAIDO	East Pacific coast	HFH	Hidakahorobetsu Hatchery	Hidakahorobetsu River	Hidakahorobetsu River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J07-18	fed	fry	500,000	Shibetsu07chum-alc	ALC Mark-double ring			
J07-19	fed	fry	600,000	Ichani07chum-1	2-7H			CHILLER
J07-20	fed	fry	1,300,000	Ichani07chum-2	2-8H			CHILLER
J07-21	fed	fry	600,000	Ichani07chum-3	2-9H			CHILLER
J07-22	fed	fry	1,800,000	Ichani07chum-4	2-4-2H			CHILLER
J07-23	fed	fry	1,200,000	Ichani07chum-5	2-4-3H			CHILLER
J07-24	fed	fry	1,300,000	Ichani07chum-6	2-4-4H			CHILLER
J07-25	fed	fry	1,200,000	Ichani07chum-7	2-5-2H			CHILLER
J07-26	fed	fry	25,000,000	Nishibetsu07chum	2,6nH			CHILLER
J07-27	fed	fry	9,100,000	Kushiro07chum	2-2-3-3H			CHILLER
J07-28	fed	fry	12,400,000	Tokachi07chum-1	2-5-3H			CHILLER
J07-29	fed	fry	2,900,000	Tokachi07chum-2	2-5-4H			CHILLER
J07-30	fed	fry	500,000	Tokachi07chum-alc	ALC Mark-double ring			
J07-31	fed	fry	670,000	Shizunai07chum-1	2-3-2H			CHILLER
J07-32	fed	fry	2,870,000	Shizunai07chum-2	2-3-3H			CHILLER
J07-33	fed	fry	2,860,000	Shizunai07chum-3	2-3-4H			CHILLER
J07-34	fed	fry	500,000	Hidakahorobetsu07chum-alc	ALC Mark-single ring			

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J07-18			ALC + Finclips
J07-19	(1X)12C:12H,(1X)12C:36H,(7X)12C:12H	down(8-4°C)	
J07-20	(1X)12C:12H,(1X)12C:36H,(8X)12C:12H	down(8-4°C)	
J07-21	(1X)12C:12H,(1X)12C:36H,(9X)12C:12H	down(8-4°C)	
J07-22	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4°C)	
J07-23	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4°C)	
J07-24	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(8-4°C)	
J07-25	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4°C)	
J07-26	(1X)24C:24H,(1X)24C:48H,(6X)12C:12H	down(9-5°C)	
J07-27	(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)	
J07-28	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(9-5°C)	
J07-29	(1X)12C:12H,(1X)12C:36H,(4X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(9-5°C)	
J07-30			ALC + Finclips
J07-31	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(10-6°C)	
J07-32	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(10-6°C)	
J07-33	(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(10-6°C)	
J07-34			ALC + Finclips

**Table1. Continued.**

No	MARK TYPE	BROOD YEAR	YEAR OF RELEASE	SPECIES	COUNTRY	STATE/ PROVINCE	REGION	AGENCY	FACILITY	STOCK	FINAL RELEASE SITE
J07-35	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River
J07-36	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River
J07-37	TM	2007	2008	CHUM	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Yakumo Hatchery	Yurappu River	Yurappu River
J07-38	TM	2007	2008	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J07-39	TM	2007	2008	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J07-40	TM	2007	2008	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J07-41	TM	2007	2008	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Katagishi Hatchery	Katagishi River	Katagishi River
J07-42	TM	2007	2008	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Tarou Hatchery	Tarou River	Tarou River
J07-43	TM	2007	2008	CHUM	JAPAN	HONSHU	Pacific coast	NASREC	Tarou Hatchery	Tarou River	Tarou River

No	REARING TREATMENT	STAGE	PRELIMINARY NUMBER OF TM RELEASED	OM ID	HATCH CODE	GRAPHIC IMAGE		MARKING SYSTEM
						PREHATCH	POSTHATCH	
J07-35	fed	fry	6,500,000	Yurappu07chum-1	2-2-3H			CHILLER
J07-36	fed	fry	500,000	Yurappu07chum-2	2-2-4H			CHILLER
J07-37	fed	fry	500,000	Yurappu07chum-3	2-2-5H			CHILLER
J07-38	fed	fry	2,000,000	Katagishi07chum-1	2,3H			CHILLER
J07-39	fed	fry	1,000,000	Katagishi07chum-2	2,4H			CHILLER
J07-40	fed	fry	1,000,000	Katagishi07chum-3	2,5H			CHILLER
J07-41	fed	fry	1,000,000	Katagishi07chum-4	2-2,2H			CHILLER
J07-42	fed	fry	2,000,000	Tarou07chum-1	2,2nH			CHILLER
J07-43	fed	fry	2,000,000	Tarou07chum-2	2n-2H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J07-35	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(8-4°C)	
J07-36	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(4X)12C:12H	down(8-4°C)	
J07-37	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(5X)12C:12H	down(8-4°C)	
J07-38	(1X)12C:12H,(1X)12C:24H,(3X)12C:12H	down(12-8°C)	
J07-39	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H	down(12-8°C)	
J07-40	(1X)12C:12H,(1X)12C:24H,(5X)12C:12H	down(12-8°C)	
J07-41	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:24H,(2X)12C:12H	down(12-8°C)	
J07-42	(1X)24C:24H,(1X)24C:48H,(2X)12C:12H	down(12-8°C)	
J07-43	(1X)12C:12H,(1X)12C:36H,(2X)24C:24H	down(12-8°C)	

**Table2.** Proposed otolith mark releases from Japan for 2007 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
J07-44	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J07-45	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Kitamihorobetsu River
J07-46	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-47	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Kitami Hatchery	Tokoro River	Tokoro River
J07-48	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Kitami Hatchery	Tokoro River	Tokoro River
J07-49	ALC	2007	2008	PINK	JAPAN	HOKKAIDO	Okhotsk Sea coast	HFH	Abashiri Hatchery	Abashiri River	Abashiri River
J07-50	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Sashirui River	Sashirui River
J07-51	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Rausu River	Rausu River
J07-52	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nijibetsu Hatchery	Shunkarikotan River	Shunkarikotan River
J07-53	TM	2007	2008	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Ichani Hatchery	Ichani River	Ichani River
J07-54	ALC	2007	2008	PINK	JAPAN	HOKKAIDO	Nemuro Strait coast	HFH	Touhoro Hatchery	Touhoro River	Touhoro River
J07-55	TM	2007	2008	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	
J07-44	fed	fry	1,700,000	Tokushibetsu07pink	2-3H			CHILLER
J07-45	fed	fry	2,000,000	Kitamihorobetsu07pink	2,3nH			CHILLER
J07-46	fed	fry	4,400,000	Shari07pink	2,3nH			CHILLER
J07-47	fed	fry	500,000	Tokoro07pink-1	2,3n-2nH			CHILLER
J07-48	fed	fry	500,000	Tokoro07pink-2	2,2n-3nH			CHILLER
J07-49	fed	fry	2,500,000	Abashiri07pink-alc	ALC Mark-single ring			
J07-50	fed	fry	1,000,000	Sashirui07pink	2,3nH			CHILLER
J07-51	fed	fry	1,000,000	Rausu07pink	2,3nH			CHILLER
J07-52	fed	fry	2,000,000	Shunkarikotan07pink	2,3nH			CHILLER
J07-53	fed	fry	4,500,000	Ichani07pink	2,4H			CHILLER
J07-54	fed	fry	4,000,000	Touhoro07pink-alc	ALC Mark-single ring			
J07-55	fed	fry	5,000,000	Kushiro07pink	2,3nH			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J07-44	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(7-4°C)	
J07-45	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(7-4°C)	
J07-46	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4°C)	
J07-47	(1X)24C:24H,(1X)24C:48H,(2X)12C:12H	down(12-8°C)	
J07-48	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:36H,(3X)12C:12H	down(12-8°C)	
J07-49			
J07-50	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(9-5°C)	
J07-51	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(9-5°C)	
J07-52	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(9-5°C)	
J07-53	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	
J07-54			
J07-55	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	down(8-4°C)	

**Table3.** Proposed otolith mark releases from Japan for 2007 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
J07-56	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetsu Hatchery	Shiribetsu River	Shubuto River
J07-57	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
J07-58	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
J07-59	TM	2007	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
J07-60	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Yakumo Hatchery	Shiribetsu River	Shiribetsu River
J07-61	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Yakumo Hatchery	Shiribetsu River	Shiribetsu River
J07-62	TM	2007	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Yakumo Hatchery	Shiribetsu River	Shiribetsu River
J07-63	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J07-64	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J07-65	TM	2007	2009	MASU	JAPAN	HOKKAIDO	Japan Sea coast	NASREC	Chitose Hatchery	Ishikari River	Ishikari River
J07-66	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
J07-67	TM	2007	2008	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	
J07-56	unfed	fry	500,000	Shubuto07masu-f	2,2H			CHILLER
J07-57	fed	fry	640,000	Shiribetsu07masu-r-f	2,2H			CHILLER
J07-58	fed	juvenile	110,000	Shiribetsu07masu-r-j	2,2H			CHILLER
J07-59	fed	smolt	110,000	Shiribetsu07masu-r-s	2,2H			CHILLER
J07-60	fed	fry	120,000	Shiribetsu07masu-y-f	2,2,2H			CHILLER
J07-61	fed	juvenile	110,000	Shiribetsu07masu-y-j	2,2,2H			CHILLER
J07-62	fed	smolt	110,000	Shiribetsu07masu-y-s	2,2,2H			CHILLER
J07-63	fed	fry	30,000	Chitose07masu-f	2,3H			CHILLER
J07-64	fed	juvenile	40,000	Chitose07masu-j	2,3H			CHILLER
J07-65	fed	smolt	30,000	Chitose07masu-s	2,3H			CHILLER
J07-66	fed	fry	400,000	Tokushibetsu07masu-f	2,3nH			CHILLER
J07-67	fed	juvenile	100,000	Tokushibetsu07masu-j	2,3nH			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J07-56	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	
J07-57	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	
J07-58	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	TM + Finclips
J07-59	(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(10-6°C)	TM + Finclips
J07-60	(1X)24C:24H,(1X)24C:48H,(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(8-4°C)	TM + Finclips
J07-61	(1X)24C:24H,(1X)24C:48H,(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(8-4°C)	TM + Finclips
J07-62	(1X)24C:24H,(1X)24C:48H,(1X)24C:24H,(1X)24C:48H,(2X)24C:24H	down(8-4°C)	TM + Finclips
J07-63	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	
J07-64	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	TM + Finclips
J07-65	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	down(8-4°C)	TM + Finclips
J07-66	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	down(8-4°C)	
J07-67	(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
J07-68	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-69	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-70	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-71	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-72	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-73	TM	2007	2009	MASU	JAPAN	HOKKAIDO	Okhotsk Sea coast	NASREC	Shari Hatchery	Shari River	Shari River
J07-74	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J07-75	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J07-76	TM	2007	2009	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Ichani River	Ichani River
J07-77	TM	2007	2008	MASU	JAPAN	HOKKAIDO	Nemuro Strait coast	NASREC	Nemuro Hatchery	Shibetsu River	Shibetsu River
J07-78	TM	2007	2009	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	
J07-68	fed	fry	400,000	Shari07masu-f	6H			CHILLER
J07-69	unfed	egg	-	Shari07masu-e-1	5H			CHILLER
J07-70	unfed	egg	-	Shari07masu-e-2	4H			CHILLER
J07-71	unfed	egg	-	Shari07masu-e-3	3H			CHILLER
J07-72	fed	juvenile	100,000	Shari07masu-j	6H			CHILLER
J07-73	fed	smolt	100,000	Shari07masu-s	6H			CHILLER
J07-74	fed	fry	40,000	Ichani07masu-f	2,4H			CHILLER
J07-75	fed	juvenile	30,000	Ichani07masu-j	2,4H			CHILLER
J07-76	fed	smolt	30,000	Ichani07masu-s	2,4H			CHILLER
J07-77	fed	fry	188,000	Shibetsu07masu-f	2,4H			CHILLER
J07-78	fed	smolt	12,000	Shibetsu07masu-s	2,4H			CHILLER

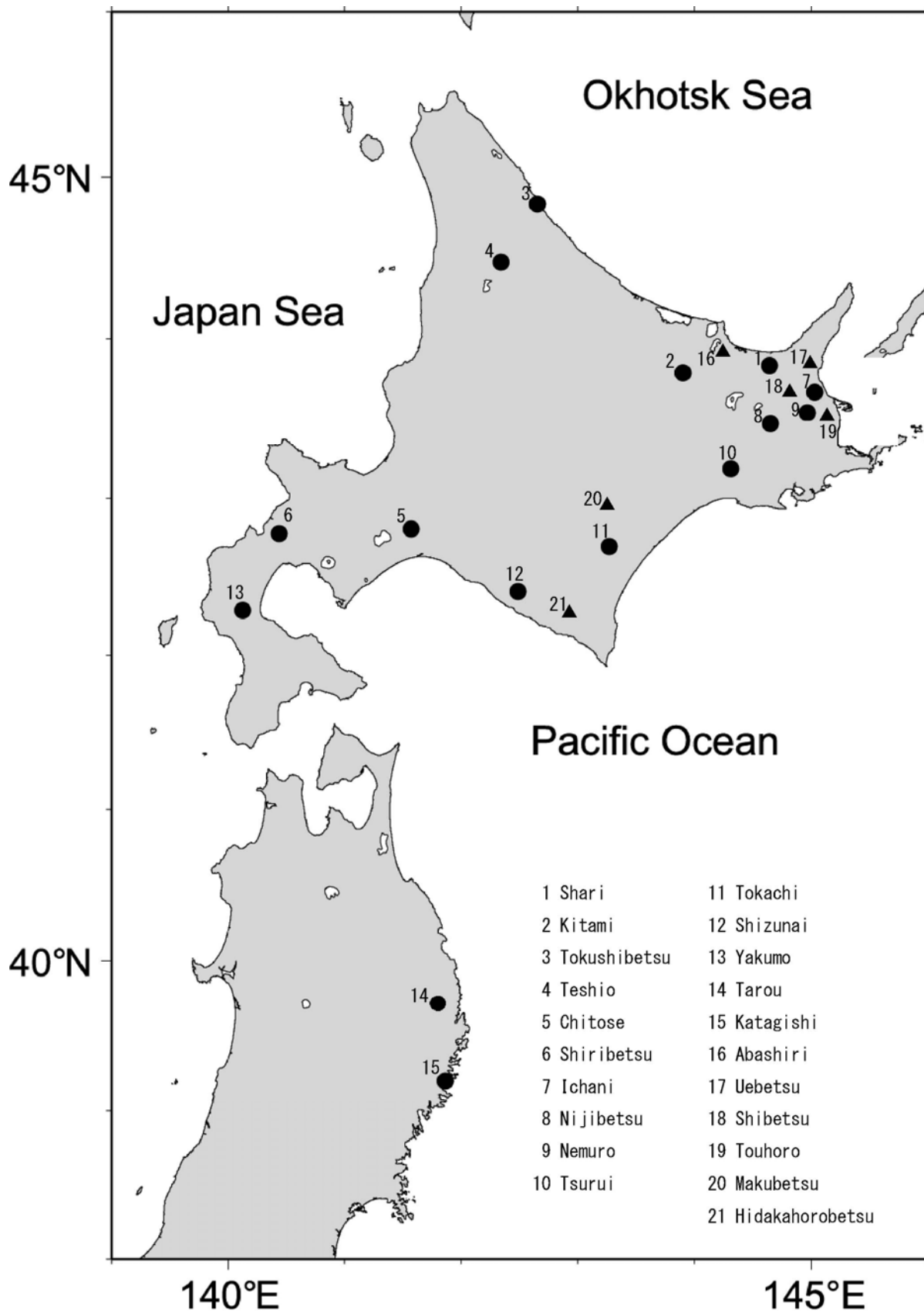
No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J07-68	(6X)24C:24H	down(8-4°C)	
J07-69	(5X)24C:24H	down(8-4°C)	
J07-70	(4X)24C:24H	down(8-4°C)	
J07-71	(3X)24C:24H	down(8-4°C)	
J07-72	(6X)24C:24H	down(8-4°C)	TM + Finclips
J07-73	(6X)24C:24H	down(8-4°C)	TM + Finclips
J07-74	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	
J07-75	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips
J07-76	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips
J07-77	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	
J07-78	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	down(8-4°C)	TM + Finclips

**Table 4.** Proposed otolith mark releases from Japan for 2007 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
J07-79	TM	2007	2008	SOCKEYE	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Tsurui Hatchery	Kushiro River	Kushiro River
J07-80	TM	2007	2008	SOCKEYE	JAPAN	HOKKAIDO	West Pacific coast	NASREC	Shizunai Hatchery	Shizunai River	Shizunai River
J07-81	TM	2007	2008	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	
J07-79	fed	smolt	10,000	Kushiro07sockeye	2,6H			CHILLER
J07-80	fed	smolt	10,000	Shizunai07sockeye	2,7H			CHILLER
J07-81	fed	smolt	10,000	Abira07sockeye	2,9H			CHILLER

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
J07-79	(1X)24C:24H,(1X)24C:48H,(6X)24C:24H	down(10-6°C)	
J07-80	(1X)24C:24H,(1X)24C:48H,(7X)24C:24H	down(10-6°C)	
J07-81	(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).