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Proposed Otolith Marks for Brood Year 2015 Salmon in Japan

by

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Abstract

Japan plans to mark approximately 271 million salmon of the 2015 brood year (241.7 million chum, 25.4 million pink, 3.4 million masu, and 150 thousand sockeye salmon) using 104 discrete thermal patterns and four ALC (alizarin complexone) patterns at 49 hatcheries. Two rings in the first band are adopted as the base mark to distinguish Japanese chum and pink salmon from other stocks.

Keywords: Japan, otolith, thermal mark, ALC, salmon release

Background

In Japan, thermal otolith marks have been 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 (Kawana et al. 1999; Urawa et al. 2000a, 2004, 2006, 2009; Sato et al. 2009). In addition, otolith marking is expected as a tool to evaluate accuracy of homing migration and abundance of hatchery and natural spawning stocks.

Mark Plan

The proposed otolith marks for the 2015 brood year salmon include 104 discrete thermal patterns and four ALC (alizarin complexone) patterns (Table 1). We plan to mark approximately 241.7 million chum, 25.4 million pink, 3.4 million masu, and 150 thousand sockeye salmon at 49 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. 2000b). All thermal rings are induced by cooler temperature exposures.

ALC marks are used for pink and masu salmon surveys by Hokkaido Research Organization and Yamagata Prefectural Inland Water Fisheries Experimental Station.

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Table 1. Proposed otolith mark releases from Japan for 2015 brood year stocks of chum, pink, masu and sockeye salmon. TM, otolith thermal marking; ALC, alizarin complexone; FRA, Fisheries Research Agency; YFPF, Yamagata Fisheries Promotion Foundation; IIFTC, Iwate Prefectural Inland Fisheries Technology Center; NPH, non-profit private hatchery. **Red characters indicate items updated on August 27, 2015.**

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-01	TM	2015	2016	Chum	Hokkaido	Okhotsk Sea coast	NPH	Horonai Hatchery	Horonai River	Horonai River
JP15-02	TM	2015	2016	Chum	Hokkaido	Okhotsk Sea coast	NPH	Horonai Hatchery	Horonai River	Horonai River
JP15-03	TM	2015	2016	Chum	Hokkaido	Okhotsk Sea coast	FRA	Shari Hatchery	Shari River	Shari River
JP15-04	TM	2015	2016	Chum	Hokkaido	Okhotsk Sea coast	FRA	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
JP15-05	TM	2015	2016	Chum	Hokkaido	Okhotsk Sea coast	FRA	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
JP15-06	TM	2015	2016	Chum	Hokkaido	Okhotsk Sea coast	NPH	Shintonbetsu Hatchery	Tonbetsu River	Tonbetsu River
JP15-07	TM	2015	2016	Chum	Hokkaido	Okhotsk Sea coast	NPH	Shintonbetsu Hatchery	Tonbetsu River	Tonbetsu River
JP15-08	TM	2015	2016	Chum	Hokkaido	Nemuro Strait coast	FRA	Ichani Hatchery	Ichani River	Ichani River
JP15-09	TM	2015	2016	Chum	Hokkaido	Nemuro Strait coast	FRA	Nijibetsu Hatchery	Nishibetsu River	Nishibetsu River
JP15-10	TM	2015	2016	Chum	Hokkaido	Nemuro Strait coast	FRA	Nijibetsu Hatchery	Nishibetsu River	Nishibetsu River
JP15-11	TM	2015	2016	Chum	Hokkaido	Nemuro Strait coast	FRA	Nijibetsu Hatchery	Nishibetsu River	Nishibetsu River
JP15-12	TM	2015	2016	Chum	Hokkaido	Nemuro Strait coast	NPH	Shibetsu Hatchery	Shibetsu River	Shibetsu River
JP15-13	TM	2015	2016	Chum	Hokkaido	Nemuro Strait coast	NPH	Shibetsu Hatchery	Shibetsu River	Shibetsu River
JP15-14	TM	2015	2016	Chum	Hokkaido	East Pacific coast	NPH	Saruru Hatchery	Shizunai River	Erimo misaki Fish Port
JP15-15	TM	2015	2016	Chum	Hokkaido	East Pacific coast	NPH	Hiroo Hatchery	Hiroo River	Hiroo River
JP15-16	TM	2015	2016	Chum	Hokkaido	East Pacific coast	NPH	Hiroo Hatchery	Hiroo River	Hiroo River
JP15-17	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tsurui Hatchery	Kushiro River	Kushiro River
JP15-18	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tsurui Hatchery	Kushiro River	Kushiro River
JP15-19	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tsurui Hatchery	Kushiro River	Kushiro River
JP15-20	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tsurui Hatchery	Kushiro River	Kushiro River

No	Stage	Preliminary Number of OM Released	OM ID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-01	fry	2,100,000	Horonai15Chum1	2,5nH			Down
JP15-02	fry	2,100,000	Horonai15Chum2	2,8H			Down
JP15-03	fry	11,600,000	Shari15Chum	2-2-2-2H			Down
JP15-04	fry	600,000	Tokushibetsu15Chum1	2-2,2,3H			Down
JP15-05	fry	10,500,000	Tokushibetsu15Chum2	2,2,2,3H			Down
JP15-06	fry	2,100,000	Tonbetsu15Chum1	2,5nH			Down
JP15-07	fry	2,100,000	Tonbetsu15Chum2	2,8H			Down
JP15-08	fry	8,000,000	Ichani15Chum	2-4-2H			Down
JP15-09	fry	5,000,000	Nishibetsu15Chum1	2,1n,5nH			Down
JP15-10	fry	10,200,000	Nishibetsu15Chum2	2,1n,4nH			Down
JP15-11	fry	9,800,000	Nishibetsu15Chum3	2,1n,3nH			Down
JP15-12	fry	2,100,000	Shibetsu15Chum1	2,3,4H			Up
JP15-13	fry	2,100,000	Shibetsu15Chum2	2,3-4H			Up
JP15-14	fry	2,000,000	Erimo15Chum	2-3,1,2H			Down
JP15-15	fry	2,100,000	Hiroo15Chum1	2n-4H			Down
JP15-16	fry	2,100,000	Hiroo15Chum2	2,4,1,2H			Down
JP15-17	fry	1,300,000	Kushiro15Chum1	2-9H			Down
JP15-18	fry	1,600,000	Kushiro15Chum2	2-2-3-3H			Down
JP15-19	fry	3,000,000	Kushiro15Chum3	2-8H			Down
JP15-20	fry	3,200,000	Kushiro15Chum4	2-10H			Down

No	Otolith Mark Schedule	Comments
JP15-01	(1X)24C:24H,(1X)24C:48H,(5X)12C:12H	
JP15-02	(1X)12C:12H,(1X)12C:24H,(8X)12C:12H	
JP15-03	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(2X)12C:12H	
JP15-04	(1X)12C:12H,(1X)12C:48H,(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(3X)12C:12H	
JP15-05	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(3X)12C:12H	
JP15-06	(1X)24C:24H,(1X)24C:48H,(5X)12C:12H	
JP15-07	(1X)12C:12H,(1X)12C:24H,(8X)12C:12H	
JP15-08	(1X)12C:12H,(1X)12C:36H,(3X)12C:12H,(1X)12C:36H,(2X)12C:12H	
JP15-09	(1X)24C:24H,(1X)24C:48H,(1X)12C:24H,(5X)12C:12H	
JP15-10	(1X)24C:24H,(1X)24C:48H,(1X)12C:24H,(4X)12C:12H	
JP15-11	(1X)24C:24H,(1X)24C:48H,(1X)12C:24H,(3X)12C:12H	
JP15-12	(1X)12H:12C,(1X)12H:24C,(2X)12H:12C,(1X)12H:24C,(4X)12H:12C	
JP15-13	(1X)12H:12C,(1X)12H:24C,(2X)12H:12C,(1X)12H:48C,(4X)12H:12C	
JP15-14	(1X)12C:12H,(1X)12C:48H,(2X)12C:12H,(2X)12C:24H,(2X)12C:12H	
JP15-15	(1X)12C:12H,(1X)12C:48H,(4X)24C:24H	
JP15-16	(1X)12C:12H,(1X)12C:24H,(3X)12C:12H,(2X)12C:24H,(2X)12C:12H	
JP15-17	(1X)12C:12H,(1X)12C:48H,(9X)12C:12H	
JP15-18	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(2X)12C:12H,(1X)12C:36H,(3X)12C:12H	
JP15-19	(1X)12C:12H,(1X)12C:48H,(8X)12C:12H	
JP15-20	(1X)12C:12H,(1X)12C:48H,(10X)12C:12H	

Table 1. Continued.

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-21	TM	2015	2016	Chum	Hokkaido	East Pacific coast	NPH	Ashibetsu Hatchery	Kushiro River	Kushiro River
JP15-22	TM	2015	2016	Chum	Hokkaido	East Pacific coast	NPH	Ashibetsu Hatchery	Kushiro River	Kushiro River
JP15-23	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-24	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-25	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-26	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-27	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-28	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-29	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-30	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-31	TM	2015	2016	Chum	Hokkaido	East Pacific coast	FRA	Tokachi Hatchery	Tokachi River	Tokachi River
JP15-32	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Yakumo Hatchery	Ainumanai River	Ainumanai River
JP15-33	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Yakumo Hatchery	Ainumanai River	Ainumanai River
JP15-34	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Chitose Hatchery	Ishikari River	Ishikari River
JP15-35	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Chitose Hatchery	Ishikari River	Ishikari River
JP15-36	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Chitose Hatchery	Ishikari River	Ishikari River
JP15-37	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Chitose Hatchery	Ishikari River	Ishikari River
JP15-38	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	NPH	Sapporo Salmon Museum	Ishikari River	Ishikari River
JP15-39	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	NPH	Kyogoku Hatchery	Shiribetsu River	Shiribetsu River
JP15-40	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	NPH	Kyogoku Hatchery	Shiribetsu River	Shiribetsu River

No	Stage	Preliminary Number of OM Released	OM ID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-21	fry	1,750,000	Kushiro15Chum5	2n,2n-2H			Down
JP15-22	fry	1,750,000	Kushiro15Chum6	2n-2n,2H			Down
JP15-23	fry	2,400,000	Tokachi15Chum1	2-5-3H			Down
JP15-24	fry	1,450,000	Tokachi15Chum2	2-5,3H			Down
JP15-25	fry	1,400,000	Tokachi15Chum3	2,5-3H			Down
JP15-26	fry	1,450,000	Tokachi15Chum4	2,5,2H			Down
JP15-27	fry	1,400,000	Tokachi15Chum5	2-5-2H			Down
JP15-28	fry	1,400,000	Tokachi15Chum6	2,5,4H			Down
JP15-29	fry	1,450,000	Tokachi15Chum7	2-5,2H			Down
JP15-30	fry	1,450,000	Tokachi15Chum8	2,5,3H			Down
JP15-31	fry	2,900,000	Tokachi15Chum9	2,5-2H			Down
JP15-32	fry	2,200,000	Ainumanai15Chum1	2-5H			Down
JP15-33	fry	2,200,000	Ainumanai15Chum2	2,2,1,2H			Down
JP15-34	fry	1,400,000	Ishikari15Chum1	2,2n,3H			Down
JP15-35	fry	1,400,000	Ishikari15Chum2	2,4n,3H			Down
JP15-36	fry	2,800,000	Ishikari15Chum3	2,6n,3H			Down
JP15-37	fry	24,400,000	Ishikari15Chum4	2,3-3H			Down
JP15-38	fry	86,000	Ishikari15Chum5	2-2H			Down
JP15-39	fry	2,100,000	Shiribetsu15Chum1	2-5H			Down
JP15-40	fry	2,100,000	Shiribetsu15Chum2	2,2,1,2H			Down

No	Otolith Mark Schedule	Comments
JP15-21	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:48H,(2X)24C:24H	
JP15-22	(1X)12C:12H,(1X)12C:48H,(1X)12C:12H,(1X)12C:24H,(2X)24C:24H	
JP15-23	(1X)12C:12H,(1X)12C:48H,(4X)12C:12H,(1X)12C:48H,(3X)12C:12H	
JP15-24	(1X)12C:12H,(1X)12C:48H,(4X)12C:12H,(1X)12C:24H,(3X)12C:12H	
JP15-25	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,(1X)12C:48H,(3X)12C:12H	
JP15-26	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,(1X)12C:24H,(2X)12C:12H	
JP15-27	(1X)12C:12H,(1X)12C:48H,(4X)12C:12H,(1X)12C:48H,(2X)12C:12H	
JP15-28	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,(1X)12C:24H,(4X)12C:12H	
JP15-29	(1X)12C:12H,(1X)12C:48H,(4X)12C:12H,(1X)12C:24H,(2X)12C:12H	
JP15-30	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,(1X)12C:24H,(3X)12C:12H	
JP15-31	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,(1X)12C:48H,(2X)12C:12H	
JP15-32	(1X)12C:12H,(1X)12C:48H,(5X)12C:12H	
JP15-33	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(2X)12C:24H,(2X)12C:12H	
JP15-34	(1X)12C:12H,(1X)12C:24H,(1X)3C:9H,(1X)3C:21H,(3X)12C:12H	
JP15-35	(1X)12C:12H,(1X)12C:24H,(3X)3C:9H,(1X)3C:21H,(3X)12C:12H	
JP15-36	(1X)12C:12H,(1X)12C:24H,(5X)3C:9H,(1X)3C:21H,(3X)12C:12H	
JP15-37	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:36H,(3X)12C:12H	
JP15-38	(1X)24C:24H,(1X)24C:72H,(2X)24C:24H	
JP15-39	(1X)12C:12H,(1X)12C:48H,(5X)12C:12H	
JP15-40	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(2X)12C:24H,(2X)12C:12H	

Table1. Continued.

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-41	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	NPH	Nakagawa Hatchery	Teshio River	Teshio River
JP15-42	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	NPH	Nakagawa Hatchery	Teshio River	Teshio River
JP15-43	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Teshio Hatchery	Teshio River	Teshio River
JP15-44	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Teshio Hatchery	Teshio River	Teshio River
JP15-45	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Teshio Hatchery	Teshio River	Teshio River
JP15-46	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Teshio Hatchery	Teshio River	Teshio River
JP15-47	TM	2015	2016	Chum	Hokkaido	Japan Sea coast	FRA	Teshio Hatchery	Teshio River	Teshio River
JP15-48	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Shirikishinai Hatchery	Shirikishinai River	Shirikishinai River
JP15-49	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Shirikishinai Hatchery	Shirikishinai River	Shirikishinai River
JP15-50	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Hidakahorobetsu Hatchery	Hidakahorobetsu River	Hidakahorobetsu River
JP15-51	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Hidakahorobetsu Hatchery	Hidakahorobetsu River	Hidakahorobetsu River
JP15-52	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Shikui Hatchery	Shikui River	Shikui River
JP15-53	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Shikui Hatchery	Shikui River	Shikui River
JP15-54	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Shiriuchi Hatchery	Shiriuchi River	Shiriuchi River
JP15-55	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Shiriuchi Hatchery	Shiriuchi River	Shiriuchi River
JP15-56	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Shiriuchi Hatchery	Shiriuchi River	Shiriuchi River
JP15-57	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Shizunai Hatchery	Shizunai River	Shizunai River
JP15-58	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Shizunai Hatchery	Shizunai River	Shizunai River
JP15-59	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Shizunai Hatchery	Shizunai River	Shizunai River
JP15-60	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Shizunai Hatchery	Shizunai River	Shizunai River

No	Stage	Preliminary Number of OM Released	OM ID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-41	fry	2,100,000	Teshio15Chum1	2-5H			Down
JP15-42	fry	2,100,000	Teshio15Chum2	2,2,1,2H			Down
JP15-43	fry	700,000	Teshio15Chum3	2,1-3H			Down
JP15-44	fry	700,000	Teshio15Chum4	2-1,3H			Down
JP15-45	fry	1,200,000	Teshio15Chum5	2n-3H			Down
JP15-46	fry	1,400,000	Teshio15Chum6	2-1-2H			Down
JP15-47	fry	1,000,000	Teshio15Chum7	2,3,2H			Down
JP15-48	fry	2,100,000	Shirikishinai15Chum1	2-7H			Down
JP15-49	fry	2,100,000	Shirikishinai15Chum2	2,2n-2nH			Down
JP15-50	fry	2,100,000	Hidakahorobetsu15Chum1	2-7H			Down
JP15-51	fry	2,100,000	Hidakahorobetsu15Chum2	2,2n-2nH			Down
JP15-52	fry	1,400,000	Shikui15Chum1	2-7H			Down
JP15-53	fry	1,400,000	Shikui15Chum2	2,2n-2nH			Down
JP15-54	fry	850,000	Shiriuchi15Chum1	2,3-2H			Down
JP15-55	fry	850,000	Shiriuchi15Chum2	2-2,3H			Up
JP15-56	fry	800,000	Shiriuchi15Chum3	2-3,2H			Down
JP15-57	fry	700,000	Shizunai15Chum1	2,2,5H			Down
JP15-58	fry	600,000	Shizunai15Chum2	2,2,6H			Down
JP15-59	fry	600,000	Shizunai15Chum3	2,2-4H			Down
JP15-60	fry	2,900,000	Shizunai15Chum4	2,2-5H			Down

No	Otolith Mark Schedule	Comments
JP15-41	(1X)12C:12H,(1X)12C:48H,(5X)12C:12H	
JP15-42	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(2X)12C:24H,(2X)12C:12H	
JP15-43	(1X)12C:12H,(1X)12C:24H,(1X)12C:48H,(3X)12C:12H	
JP15-44	(1X)12C:12H,(1X)12C:48H,(1X)12C:24H,(3X)12C:12H	
JP15-45	(1X)12C:12H,(1X)12C:36H,(3X)24C:24H	
JP15-46	(1X)12C:12H,(2X)12C:48H,(2X)12C:12H	
JP15-47	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:24H,(2X)12C:12H	
JP15-48	(1X)12C:12H,(1X)12C:48H,(7X)12C:12H	
JP15-49	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:48H,(2X)12C:12H	
JP15-50	(1X)12C:12H,(1X)12C:48H,(7X)12C:12H	
JP15-51	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:48H,(2X)12C:12H	
JP15-52	(1X)12C:12H,(1X)12C:48H,(7X)12C:12H	
JP15-53	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:48H,(2X)12C:12H	
JP15-54	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:48H,(2X)12C:12H	
JP15-55	(1X)12H:12C,(1X)12H:48C,(1X)12H:12C,(1X)12H:24C,(3X)12H:12C	
JP15-56	(1X)12H:12C,(1X)12H:48C,(2X)12H:12C,(1X)12H:24C,(2X)12H:12C	
JP15-57	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(5X)12C:12H	
JP15-58	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-59	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:48H,(4X)12C:12H	
JP15-60	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:48H,(5X)12C:12H	

Table1. Continued.

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-61	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Shizunai Hatchery	Shizunai River	Shizunai River
JP15-62	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Shizunai Hatchery	Shizunai River	Shizunai River
JP15-63	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Toyohata Hatchery	Shizunai River	Shizunai River
JP15-64	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Toyohata Hatchery	Shizunai River	Shizunai River
JP15-65	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Toyohata Hatchery	Shizunai River	Shizunai River
JP15-66	TM	2015	2016	Chum	Hokkaido	West Pacific coast	NPH	Toyohata Hatchery	Shizunai River	Shizunai River
JP15-67	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Yakumo Hatchery	Yurappu River	Yurappu River
JP15-68	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Yakumo Hatchery	Yurappu River	Yurappu River
JP15-69	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Yakumo Hatchery	Yurappu River	Yurappu River
JP15-70	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Yakumo Hatchery	Yurappu River	Yurappu River
JP15-71	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Yakumo Hatchery	Yurappu River	Yurappu River
JP15-72	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Yakumo Hatchery	Yurappu River	Yurappu River
JP15-73	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Yakumo Hatchery	Yurappu River	Yurappu River
JP15-74	TM	2015	2016	Chum	Hokkaido	West Pacific coast	FRA	Yakumo Hatchery	Yurappu River	Yurappu River
JP15-75	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Masukawa Hatchery	Gakkou River	Gakkou River
JP15-76	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Masukawa Hatchery	Gakkou River	Gakkou River
JP15-77	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Jinzu Hatchery	Jinzu River	Jinzu River
JP15-78	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Jinzu Hatchery	Jinzu River	Jinzu River
JP15-79	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Kawabukuro Hatchery	Kawabukuro River	Kawabukuro River
JP15-80	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Kawabukuro Hatchery	Kawabukuro River	Kawabukuro River

No	Stage	Preliminary Number of OM Released	OM ID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-61	fry	800,000	Shizunai15Chum5	2-2,4H			Down
JP15-62	fry	800,000	Shizunai15Chum6	2-2,5H			Down
JP15-63	fry	400,000	Shizunai15Chum7	2,3,1,2H			Down
JP15-64	fry	600,000	Shizunai15Chum8	2,3,1,3H			Down
JP15-65	fry	600,000	Shizunai15Chum9	2,3,1,4H			Down
JP15-66	fry	800,000	Shizunai15Chum10	2-3,1,3H			Down
JP15-67	fry	650,000	Yurappu15Chum1	2,1n-2nH			Down
JP15-68	fry	850,000	Yurappu15Chum2	2,1n-3nH			Down
JP15-69	fry	1,000,000	Yurappu15Chum3	2,1n-4nH			Down
JP15-70	fry	1,000,000	Yurappu15Chum4	2,1n-5nH			Down
JP15-71	fry	1,000,000	Yurappu15Chum5	2,1n-6nH			Down
JP15-72	fry	1,000,000	Yurappu15Chum6	2,2n,4nH			Down
JP15-73	fry	1,000,000	Yurappu15Chum7	2,2n,5nH			Down
JP15-74	fry	1,000,000	Yurappu15Chum8	2,2n,6nH			Down
JP15-75	fry	2,100,000	Gakkou15Chum1	2,3nH			Down
JP15-76	fry	2,100,000	Gakkou15Chum2	2,1-2H			Down
JP15-77	fry	300,000	Jinzu15Chum1	2,1,2H			Down
JP15-78	fry	300,000	Jinzu15Chum2	2,4nH			Down
JP15-79	fry	2,000,000	Kawabukuro15Chum1	2,1,2,2H			Down
JP15-80	fry	2,000,000	Kawabukuro15Chum2	2-1,2H			Down

No	Otolith Mark Schedule	Comments
JP15-61	(1X)12C:12H,(1X)12C:48H,(1X)12C:12H,(1X)12C:24H,(4X)12C:12H	
JP15-62	(1X)12C:12H,(1X)12C:48H,(1X)12C:12H,(1X)12C:24H,(5X)12C:12H	
JP15-63	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(2X)12C:24H,(2X)12C:12H	
JP15-64	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(2X)12C:24H,(3X)12C:12H	
JP15-65	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(2X)12C:24H,(4X)12C:12H	
JP15-66	(1X)12C:12H,(1X)12C:48H,(2X)12C:12H,(2X)12C:24H,(3X)12C:12H	
JP15-67	(1X)24C:24H,(1X)24C:48H,(1X)12C:48H,(2X)12C:12H	
JP15-68	(1X)24C:24H,(1X)24C:48H,(1X)12C:48H,(3X)12C:12H	
JP15-69	(1X)24C:24H,(1X)24C:48H,(1X)12C:48H,(4X)12C:12H	
JP15-70	(1X)24C:24H,(1X)24C:48H,(1X)12C:48H,(5X)12C:12H	
JP15-71	(1X)24C:24H,(1X)24C:48H,(1X)12C:48H,(6X)12C:12H	
JP15-72	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:24H,(4X)12C:12H	
JP15-73	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:24H,(5X)12C:12H	
JP15-74	(1X)24C:24H,(1X)24C:48H,(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-75	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	
JP15-76	(1X)12C:12H,(1X)12C:24H,(1X)12C:48H,(2X)12C:12H	
JP15-77	(1X)12C:12H,(2X)12C:24H,(2X)12C:12H	
JP15-78	(1X)12C:12H,(1X)12C:24H,(4X)3C:9H	
JP15-79	(1X)12C:12H,(2X)12C:24H,(1X)12C:12H,(1X)12C:24H,(2X)12C:12H	
JP15-80	(1X)12C:12H,(1X)12C:48H,(1X)12C:24H,(2X)12C:12H	

Table1. Continued.

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-81	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Miomote #3 Hatchery	Miomote River	Miomote River
JP15-82	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Miomote #3 Hatchery	Miomote River	Miomote River
JP15-83	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Oirase Hatchery (Jpn sea)	Nida River	Oirase/Akashi/SasanaI River (Jpn Sea)
JP15-84	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Shougaw a Hatchery	Shou River	Shou River
JP15-85	TM	2015	2016	Chum	Honshu	Japan Sea coast	NPH	Shougaw a Hatchery	Shou River	Shou River
JP15-86	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Shimoakka Hatchery	Akka River	Akka River
JP15-87	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Shimoakka Hatchery	Akka River	Akka River
JP15-88	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Shimoakka Hatchery	Akka River	Akka River
JP15-89	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Shimoakka Hatchery	Akka River	Akka River
JP15-90	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Akedo Hatchery	Akedo River	Akedo River
JP15-91	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Akedo Hatchery	Akedo River	Akedo River
JP15-92	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Eai Hatchery	Kitakami River	Kitakami River
JP15-93	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Eai Hatchery	Kitakami River	Kitakami River
JP15-94	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-95	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-96	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-97	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-98	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-99	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-100	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River

No	Stage	Preliminary Number of OM Released	OMID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-81	fry	1,750,000	Miomote15Chum1	2,1,2H			Down
JP15-82	fry	1,750,000	Miomote15Chum2	2,7nH			Down
JP15-83	fry	1,500,000	Oirase-j15Chum	2,3n,2H			Down
JP15-84	fry	1,000,000	Shou15Chum1	2,1,2H			Down
JP15-85	fry	1,000,000	Shou15Chum2	2,4nH			Down
JP15-86	fry	4,000,000	Akka15Chum1	2,1,3H			Down
JP15-87	fry	4,000,000	Akka15Chum2	2,1,4H			Down
JP15-88	fry	3,000,000	Akka15Chum3	2,6H			Down
JP15-89	fry	1,500,000	Akka15Chum4	2-3H			Down
JP15-90	fry	1,000,000	Akedo15Chum1	2,1,3H			Down
JP15-91	fry	1,000,000	Akedo15Chum2	2,6H			Down
JP15-92	fry	1,600,000	Kitakami15Chum1	2,3H			Down
JP15-93	fry	1,600,000	Kitakami15Chum2	2,2H			Down
JP15-94	fry	100,000	Kasshi15Chum1	2,4,3H3			Down
JP15-95	fry	100,000	Kasshi15Chum2	2,4,3H2			Down
JP15-96	fry	100,000	Kasshi15Chum3	2,2,4H3			Down
JP15-97	fry	100,000	Kasshi15Chum4	2,4H3			Down
JP15-98	fry	100,000	Kasshi15Chum5	2,2,3,2H3			Down
JP15-99	fry	100,000	Kasshi15Chum6	2,2,3,2H2			Down
JP15-100	fry	2,000,000	Kasshi15Chum7	2,1,3H			Down

No	Otolith Mark Schedule	Comments
JP15-81	(1X)12C:12H,(2X)12C:24H,(2X)12C:12H	
JP15-82	(1X)12C:12H,(1X)12C:24H,(7X)3C:9H	
JP15-83	(1X)12C:12H,(1X)12C:24H,(2X)3C:9H,(1X)3C:21H,(2X)12C:12H	
JP15-84	(1X)12C:12H,(2X)12C:24H,(2X)12C:12H	
JP15-85	(1X)12C:12H,(1X)12C:24H,(4X)3C:9H	
JP15-86	(1X)12C:12H,(2X)12C:24H,(3X)12C:12H	
JP15-87	(1X)12C:12H,(2X)12C:24H,(4X)12C:12H	
JP15-88	(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-89	(1X)12C:12H,(1X)12C:48H,(3X)12C:12H	
JP15-90	(1X)12C:12H,(2X)12C:24H,(3X)12C:12H	
JP15-91	(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-92	(1X)12C:12H,(1X)12C:24H,(3X)12C:12H	
JP15-93	(1X)12C:12H,(1X)12C:24H,(2X)12C:12H	
JP15-94	(1X)12C:12H,(1X)12C:24H,(3X)12C:12H,(1X)12C:24H,(3X)12C:12H,HA TCH,(3X)12C:12H	
JP15-95	(1X)12C:12H,(1X)12C:24H,(3X)12C:12H,(1X)12C:24H,(3X)12C:12H,HA TCH,(2X)12C:12H	
JP15-96	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,HA TCH,(3X)12C:12H	
JP15-97	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,HA TCH,(3X)12C:12H	
JP15-98	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:24H,(2X)12C:12H,HA TCH,(3X)12C:12H	
JP15-99	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:24H,(2X)12C:12H,HA TCH,(2X)12C:12H	
JP15-100	(1X)12C:12H,(2X)12C:24H,(3X)12C:12H	

Table 1. Continued.

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-101	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-102	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-103	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kasshi Hatchery	Kasshi River	Kasshi River
JP15-104	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kesen Hatchery	Kesen River	Kesen River
JP15-105	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kesen Hatchery	Kesen River	Kesen River
JP15-106	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kumano Hatchery	Kumano River	Kumano River
JP15-107	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kumano Hatchery	Kumano River	Kumano River
JP15-108	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kumano Hatchery	Kumano River	Kumano River
JP15-110	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kumano Hatchery	Kumano River	Kumano River
JP15-109	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kumano Hatchery	Kumano River	Kumano River
JP15-111	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Kumano Hatchery	Kumano River	Kumano River
JP15-112	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Oirase Hatchery (Pacific)	Oirase River (Pacific)	Oirase River (Pacific)
JP15-113	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Oirase Hatchery (Pacific)	Oirase River (Pacific)	Oirase River (Pacific)
JP15-114	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Orikasa Hatchery	Orikasa River	Orikasa River
JP15-115	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Orikasa Hatchery	Orikasa River	Orikasa River
JP15-116	TM	2015	2016	Chum	Honshu	Pacific coast	FRA	FRA Miyako Lab.	Orikasa River	Orikasa River
JP15-117	TM	2015	2016	Chum	Honshu	Pacific coast	FRA	FRA Miyako Lab.	Orikasa River	Orikasa River
JP15-118	TM	2015	2016	Chum	Honshu	Pacific coast	FRA	FRA Miyako Lab.	Orikasa River	Orikasa River
JP15-119	TM	2015	2016	Chum	Honshu	Pacific coast	FRA	FRA Miyako Lab.	Orikasa River	Yamada Bay
JP15-120	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Sakari Hatchery	Sakari River	Sakari River

No	Stage	Preliminary Number of OM Released	OM ID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-101	fry	2,000,000	Kasshi15Chum8	2,1,4H			Down
JP15-102	fry	500,000	Kasshi15Chum9	2,1,5H			Down
JP15-103	fry	500,000	Kasshi15Chum10	2,6H			Down
JP15-104	fry	1,200,000	Kesen15Chum1	2,1,3H			Down
JP15-105	fry	1,200,000	Kesen15Chum2	2,6H			Down
JP15-106	fry	200,000	Kumano15Chum1	2,2,3,2H			Down
JP15-107	fry	250,000	Kumano15Chum2	2,4,3H			Down
JP15-108	fry	250,000	Kumano15Chum3	2,4H			Down
JP15-110	fry	150,000	Kumano15Chum5	2,4H2			Down
JP15-109	fry	150,000	Kumano15Chum4	2,2,4H			Down
JP15-111	fry	200,000	Kumano15Chum6	2,2,4H2			Down
JP15-112	fry	3,755,000	Oirase-p15Chum1	2-6H			Down
JP15-113	fry	3,755,000	Oirase-p15Chum2	2,2,3H			Down
JP15-114	fry	800,000	Orikasa15Chum1	2,1,3H			Down
JP15-115	fry	800,000	Orikasa15Chum2	2,6H			Down
JP15-116	fry	400,000	Orikasa15Chum3	2,5H			Down
JP15-117	fry	400,000	Orikasa15Chum4	2-2,2H			Down
JP15-118	fry	400,000	Orikasa15Chum5	2n-2H			Down
JP15-119	fry	400,000	Yamada15Chum	2,2nH			Down
JP15-120	fry	500,000	Sakari15Chum1	2,1,3H			Down

No	Otolith Mark Schedule	Comments
JP15-101	(1X)12C:12H,(2X)12C:24H,(4X)12C:12H	
JP15-102	(1X)12C:12H,(2X)12C:24H,(5X)12C:12H	
JP15-103	(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-104	(1X)12C:12H,(2X)12C:24H,(3X)12C:12H	
JP15-105	(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-106	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(2X)12C:12H,(1X)12C:24H,(2X)12C:12H	
JP15-107	(1X)12C:12H,(1X)12C:24H,(3X)12C:12H,(1X)12C:24H,(3X)12C:12H	
JP15-108	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H	
JP15-110	(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,HA TCH,(2X)12C:12H	
JP15-109	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(4X)12C:12H	
JP15-111	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(4X)12C:12H,HA TCH,(2X)12C:12H	
JP15-112	(1X)12C:12H,(1X)12C:48H,(6X)12C:12H	
JP15-113	(1X)12C:12H,(1X)12C:24H,(1X)12C:12H,(1X)12C:24H,(3X)12C:12H	
JP15-114	(1X)12C:12H,(2X)12C:24H,(3X)12C:12H	
JP15-115	(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-116	(1X)12C:12H,(1X)12C:24H,(5X)12C:12H	
JP15-117	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:24H,(2X)12C:12H	
JP15-118	(1X)12C:12H,(1X)12C:36H,(2X)24C:24H	
JP15-119	(1X)24C:24H,(1X)24C:48H,(2X)12C:12H	
JP15-120	(1X)12C:12H,(2X)12C:24H,(3X)12C:12H	

Table1. Continued.

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-121	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Sakari Hatchery	Sakari River	Sakari River
JP15-122	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Sakari Hatchery	Sakari River	Sakari River
JP15-123	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Sakari Hatchery	Sakari River	Sakari River
JP15-124	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Tarou Hatchery	Tarou River	Tarou River
JP15-125	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Tarou Hatchery	Tarou River	Tarou River
JP15-126	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Tsugaruishi Hatchery	Tsugaruishi River	Tsugaruishi River
JP15-127	TM	2015	2016	Chum	Honshu	Pacific coast	NPH	Tsugaruishi Hatchery	Tsugaruishi River	Tsugaruishi River
JP15-128	ALC	2015	2016	Pink	Hokkaido	Okhotsk Sea coast	NPH	Aioi Hatchery	Abashiri River	Abashiri River
JP15-129	TM	2015	2016	Pink	Hokkaido	Okhotsk Sea coast	FRA	Tokushibetsu Hatchery	Tokushibetsu River	Kitamihorobetsu River
JP15-130	TM	2015	2016	Pink	Hokkaido	Okhotsk Sea coast	FRA	Shari Hatchery	Shari River	Shari River
JP15-131	TM	2015	2016	Pink	Hokkaido	Okhotsk Sea coast	FRA	Shari Hatchery	Shari River	Tokoro River
JP15-132	ALC	2015	2016	Pink	Hokkaido	Okhotsk Sea coast	NPH	Oketo Hatchery	Tokoro River	Tokoro River
JP15-133	TM	2015	2016	Pink	Hokkaido	Okhotsk Sea coast	FRA	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
JP15-134	TM	2015	2016	Pink	Hokkaido	Nemuro Strait coast	FRA	Ichani Hatchery	Ichani River	Ichani River
JP15-135	TM	2015	2016	Pink	Hokkaido	Nemuro Strait coast	FRA	Ichani Hatchery	Ichani River	Ichani River
JP15-136	TM	2015	2016	Pink	Hokkaido	Nemuro Strait coast	FRA	Ichani Hatchery	Ichani River	Ichani River
JP15-137	TM	2015	2016	Pink	Hokkaido	Nemuro Strait coast	NPH	Nijibetsu Hatchery	Sashirui River etc	Shibetsu River etc
JP15-138	TM	2015	2016	Pink	Hokkaido	Nemuro Strait coast	FRA	Nijibetsu Hatchery	Shibetsu River etc	Shibetsu River
JP15-139	ALC	2015	2016	Pink	Hokkaido	Nemuro Strait coast	NPH	Shibetsu Hatchery	Shibetsu River etc	Shibetsu River
JP15-140	ALC	2015	2016	Pink	Hokkaido	Nemuro Strait coast	NPH	Kenebetsu Hatchery	Touhoro/Nishibetsu River	Touhoro River

No	Stage	Preliminary Number of OM Released	OM ID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-121	fry	500,000	Sakari15Chum2	2,1,4H			Down
JP15-122	fry	500,000	Sakari15Chum3	2,1,5H			Down
JP15-123	fry	500,000	Sakari15Chum4	2,6H			Down
JP15-124	fry	1,000,000	Tarou15Chum1	2,1,3H			Down
JP15-125	fry	1,000,000	Tarou15Chum2	2,6H			Down
JP15-126	fry	3,000,000	Tsugaruishi15Chum1	2-4H			Down
JP15-127	fry	1,000,000	Tsugaruishi15Chum2	2,7H			Down
JP15-128	fry	2,000,000	Abashiri15Pink-alc	A2H			
JP15-129	fry	1,300,000	Kitamihorobetsu15Pink	2n-3H			Down
JP15-130	fry	4,700,000	Shari15Pink	2,3nH			Down
JP15-131	fry	1,000,000	Tokoro15Pink	2,3n-2nH			Down
JP15-132	fry	2,000,000	Tokoro15Pink-alc	A1H			
JP15-133	fry	1,700,000	Tokushibetsu15Pink	2-3H			Down
JP15-134	fry	1,500,000	Ichani15Pink1	2,4H			Down
JP15-135	fry	1,500,000	Ichani15Pink2	2-2-4H			Down
JP15-136	fry	1,500,000	Ichani15Pink3	2-5H			Down
JP15-137	fry	5,300,000	Shibetsu15Pink1	2,4nH			Down
JP15-138	fry	850,000	Shibetsu15Pink2	2,6nH			Down
JP15-139	fry	1,000,000	Shibetsu15Pink-alc	A1H			
JP15-140	fry	1,000,000	Touhoro15Pink-alc	A2H			

No	Otolith Mark Schedule	Comments
JP15-121	(1X)12C:12H,(2X)12C:24H,(4X)12C:12H	
JP15-122	(1X)12C:12H,(2X)12C:24H,(5X)12C:12H	
JP15-123	(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-124	(1X)12C:12H,(2X)12C:24H,(3X)12C:12H	
JP15-125	(1X)12C:12H,(1X)12C:24H,(6X)12C:12H	
JP15-126	(1X)12C:12H,(1X)12C:48H,(4X)12C:12H	
JP15-127	(1X)12C:12H,(1X)12C:24H,(7X)12C:12H	
JP15-128		large ring double
JP15-129	(1X)12C:12H,(1X)12C:36H,(3X)24C:24H	
JP15-130	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	
JP15-131	(1X)24C:24H,(1X)24C:48H,(2X)12C:12H,(1X)12C:36H,(2X)12C:12H	
JP15-132		large ring
JP15-133	(1X)24C:24H,(1X)24C:72H,(3X)24C:24H	
JP15-134	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	
JP15-135	(1X)12C:12H,(1X)12C:36H,(1X)12C:12H,(1X)12C:36H,(4X)12C:12H	
JP15-136	(1X)12C:12H,(1X)12C:36H,(5X)12C:12H	
JP15-137	(1X)24C:24H,(1X)24C:48H,(4X)12C:12H	
JP15-138	(1X)24C:24H,(1X)24C:48H,(6X)12C:12H	
JP15-139		small ring
JP15-140		small ring double

Table1. Continued.

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-141	TM	2015	2016	Masu	Hokkaido	Okhotsk Sea coast	FRA	Shari Hatchery	Shari River	Shari River
JP15-142	TM	2015	2016	Masu	Hokkaido	Okhotsk Sea coast	FRA	Shari Hatchery	Shari River	Shari River
JP15-143	TM	2015	2017	Masu	Hokkaido	Okhotsk Sea coast	FRA	Shari Hatchery	Shari River	Shari River
JP15-144	TM	2015	2016	Masu	Hokkaido	Okhotsk Sea coast	FRA	Tokushibetsu Hatchery	Tokushibetsu River	Tokushibetsu River
JP15-145	TM	2015	2016	Masu	Hokkaido	Nemuro Strait coast	FRA	Nemuro Hatchery	Ichani River	Ichani River
JP15-146	TM	2015	2016	Masu	Hokkaido	Nemuro Strait coast	FRA	Nemuro Hatchery	Ichani River	Ichani River
JP15-147	TM	2015	2017	Masu	Hokkaido	Nemuro Strait coast	FRA	Nemuro Hatchery	Ichani River	Ichani River
JP15-148	TM	2015	2016	Masu	Hokkaido	Nemuro Strait coast	FRA	Nemuro Hatchery	Shibetsu River	Shibetsu River
JP15-149	TM	2015	2016	Masu	Hokkaido	Nemuro Strait coast	FRA	Nemuro Hatchery	Shibetsu River	Shibetsu River
JP15-150	TM	2015	2017	Masu	Hokkaido	Nemuro Strait coast	FRA	Nemuro Hatchery	Shibetsu River	Shibetsu River
JP15-151	TM	2015	2016	Masu	Hokkaido	Japan Sea coast	FRA	Chitose Hatchery	Ishikari River	Ishikari River
JP15-152	TM	2015	2016	Masu	Hokkaido	Japan Sea coast	FRA	Chitose Hatchery	Ishikari River	Ishikari River
JP15-153	TM	2015	2017	Masu	Hokkaido	Japan Sea coast	FRA	Chitose Hatchery	Ishikari River	Ishikari River
JP15-154	TM	2015	2016	Masu	Hokkaido	Japan Sea coast	FRA	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
JP15-155	TM	2015	2016	Masu	Hokkaido	Japan Sea coast	FRA	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
JP15-156	TM	2015	2016	Masu	Hokkaido	Japan Sea coast	FRA	Shiribetsu Hatchery	Shiribetsu River	Shiribetsu River
JP15-157	TM	2015	2016	Masu	Hokkaido	Japan Sea coast	FRA	Shiribetsu Hatchery	Shiribetsu River	Shubuto River
JP15-158	ALC	2015	2015	Masu	Honshu	Japan Sea coast	YFPF	YFPF Freshw. Fish. Ctr.	Captive-brood	Ira River
JP15-159	TM	2015	2016	Masu	Honshu	Pacific coast	IIFTC	IIFTC	Akka River	Akka River
JP15-160	TM	2015	2016	Masu	Honshu	Pacific coast	IIFTC	IIFTC	Akka River	Akka River

No	Stage	Preliminary Number of OM Released	OM ID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-141	fry	500,000	Shari15Masu-f	4H			Down
JP15-142	juvenile	50,000	Shari15Masu-j	4H			Down
JP15-143	smolt	50,000	Shari15Masu-s	4H			Down
JP15-144	fry	500,000	Tokushibetsu15Masu-f	2,3nH			Down
JP15-145	fry	100,000	Ichani15Masu-f	2,5H			Down
JP15-146	juvenile	30,000	Ichani15Masu-j	2,5H			Down
JP15-147	smolt	20,000	Ichani15Masu-s	2,5H			Down
JP15-148	fry	120,000	Shibetsu15Masu-f	2,4H			Down
JP15-149	juvenile	60,000	Shibetsu15Masu-j	2,4H			Down
JP15-150	smolt	20,000	Shibetsu15Masu-s	2,4H			Down
JP15-151	fry	30,000	Ishikari15Masu-f	2,3H			Down
JP15-152	juvenile	40,000	Ishikari15Masu-j	2,3H			Down
JP15-153	smolt	30,000	Ishikari15Masu-s	2,3H			Down
JP15-154	fry	760,000	Shiribetsu15Masu-f	5H			Down
JP15-155	juvenile	220,000	Shiribetsu15Masu-j	5H			Down
JP15-156	smolt	220,000	Shiribetsu15Masu-s	5H			Down
JP15-157	fry	500,000	Shubuto15Masu	3H			Down
JP15-158	eyed egg	30,000	Ira15Masu	A1H			
JP15-159	fry	50,000	Akka15Masu1	2n-3H			Down
JP15-160	fry	50,000	Akka15Masu2	2n-4H			Down

No	Otolith Mark Schedule	Comments
JP15-141	(4X)24C:24H	
JP15-142	(4X)24C:24H	
JP15-143	(4X)24C:24H	
JP15-144	(1X)24C:24H,(1X)24C:48H,(3X)12C:12H	
JP15-145	(1X)24C:24H,(1X)24C:48H,(5X)24C:24H	
JP15-146	(1X)24C:24H,(1X)24C:48H,(5X)24C:24H	
JP15-147	(1X)24C:24H,(1X)24C:48H,(5X)24C:24H	
JP15-148	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	
JP15-149	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	
JP15-150	(1X)24C:24H,(1X)24C:48H,(4X)24C:24H	
JP15-151	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	
JP15-152	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	finclips (left ventral fin)
JP15-153	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	finclips (right ventral fin)
JP15-154	(5X)24C:24H	
JP15-155	(5X)24C:24H	finclips (left ventral fin)
JP15-156	(5X)24C:24H	finclips (right ventral fin)
JP15-157	(3X)24C:24H	
JP15-158		small ring
JP15-159	(1X)12C:12H,(1X)12C:36H,(3X)24C:24H	
JP15-160	(1X)12C:12H,(1X)12C:36H,(4X)24C:24H	

Table 1. Continued.

No	Mark Type	Brood Year	Year of Release	Species	Prefecture	Region	Agency	Facility	Stock	Final Release Site
JP15-161	TM	2015	2016	Sockeye	Hokkaido	East Pacific coast	FRA	Shizunai Hatchery	Kushiro River	Kushiro River
JP15-162	TM	2015	2017	Sockeye	Hokkaido	West Pacific coast	FRA	Chitose Hatchery	Abira River	Abira River
JP15-163	TM	2015	2016	Sockeye	Hokkaido	West Pacific coast	FRA	Chitose Hatchery	Shizunai River	Shizunai River
JP15-164	TM	2015	2017	Sockeye	Hokkaido	West Pacific coast	FRA	Chitose Hatchery	Shizunai River	Shizunai River

No	Stage	Preliminary Number of OM Released	OM ID	Hatch Code	Prehatch Graphic Image	Posthatch Graphic Image	Temp Shift Direction
JP15-161	fry	50,000	Kushiro15Sockeye-f	2,3H			Down
JP15-162	smolt	50,000	Abira15Sockeye-s	2,6H			Down
JP15-163	juvenile	30,000	Shizunai15Sockeye-j	2,6H			Down
JP15-164	smolt	20,000	Shizunai15Sockeye-s	2,6H			Down

No	Otolith Mark Schedule	Comments
JP15-161	(1X)24C:24H,(1X)24C:48H,(3X)24C:24H	
JP15-162	(1X)24C:24H,(1X)24C:48H,(6X)24C:24H	
JP15-163	(1X)24C:24H,(1X)24C:48H,(6X)24C:24H	
JP15-164	(1X)24C:24H,(1X)24C:48H,(6X)24C:24H	

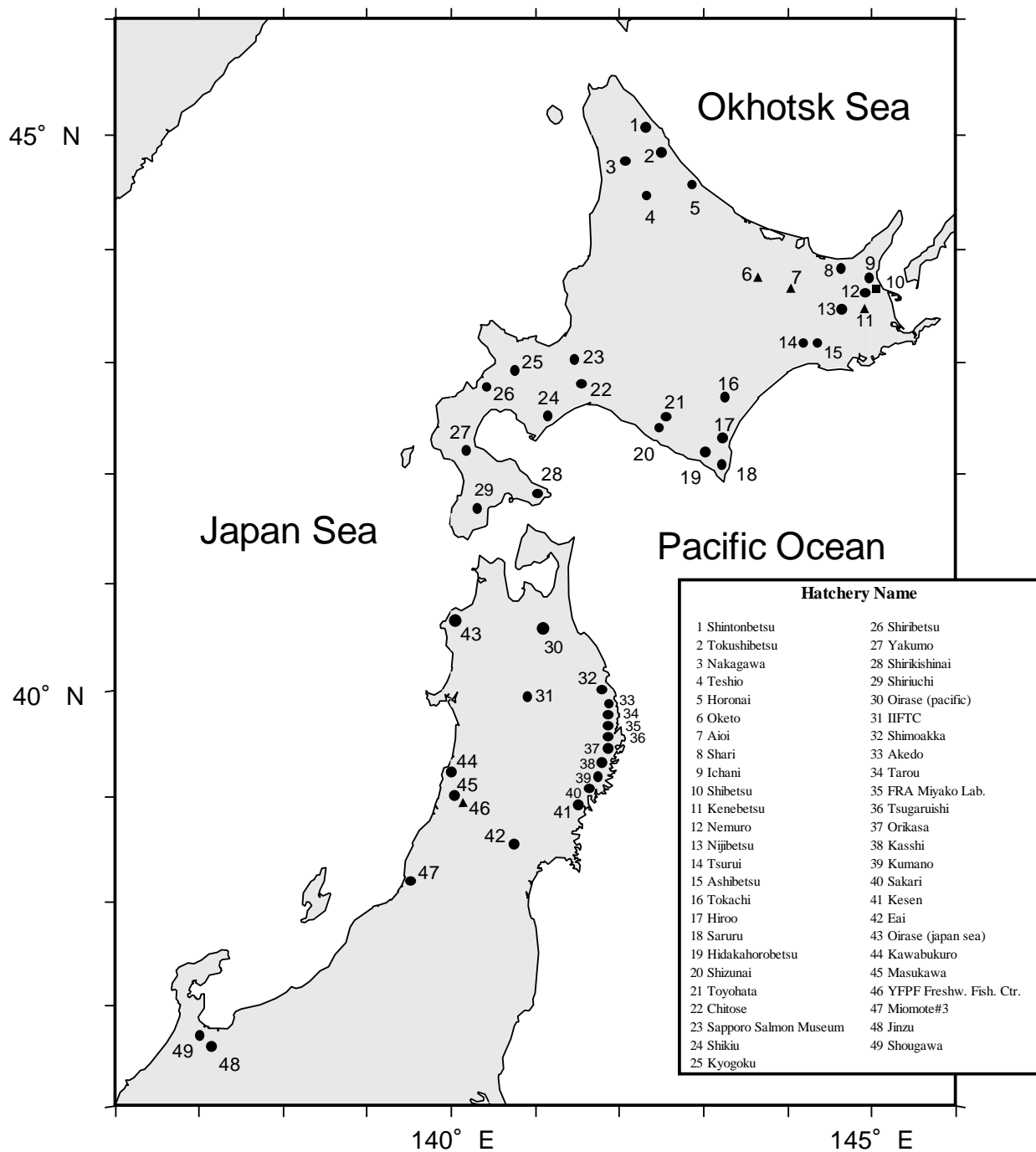


Fig. 1. Locations of hatcheries where brood year 2015 salmon will be otolith-marked. Forty-four (closed circles) and 4 (closed triangles) hatcheries conduct otolith thermal marking and ALC marking, respectively. One hatchery (closed rectangle) plans to mark using both thermal and ALC marking methods.