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Proposed Thermal Marks for Brood Year 2008 Salmon in Alaska

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Abstract

In Alaska, mass-marking of salmon using otolith thermal marking is an effective research and management tool applicable to a variety of situations. For brood year 2008, approximately 55 million sockeye, 639 million pink salmon, 572 million chum, 6 million coho, and 8 million Chinook salmon will be marked at 21 different hatcheries using 71 thermal marks.

Introduction

In Alaska, thermal marking is used to provide information about the contribution of hatchery fish, primarily pink, chum and sockeye salmon, to commercial and cost-recovery fisheries during the summer fishing season. Because most fisheries are managed on the basis of wild stocks, fishery managers subtract the estimated hatchery catch from total catch and use that information to structure the fisheries. Hatchery operators are most interested in their own production and use thermal marking to estimate how their fish contribute to traditional fisheries and to terminal harvests. In addition, thermal marks are being used to determine the origin of juvenile and immature salmon collected during surveys in the Gulf of Alaska by the National Marine Fisheries Service and as part of the Bering Sea and Aleutian Island Salmon Investigative Study (BASIS) program.

Plan for 2008 brood year stocks

The proposed thermal marks for brood year 2008 salmon are listed in Table 1. The plan is to mark approximately 55 million sockeye, 639 million pink salmon, 572 million chum, 6 million coho, and 8 million Chinook salmon at 21 different hatcheries using 71 thermal marks.

The proposed otolith plan includes scheduled changes. Some marks are on an every other year cycle, while others rotate on a three-year cycle. Thermal mark patterns are presented in both the RBr notation (Munk and Geiger 1998), as well as well as in the Uniform Hatch Code notation (Johnson et al. 2006).

References

Johnson, W.F., R.P. Josephson, T.R. Frawley, and D.S. Oxman 2006. Revised web-based north pacific salmon otolith mark directory. (NPAFC Doc. 971). 39p. Alaska Dept. Fish and Game, Juneau Alaska

Munk, K.M. and Geiger, H.J. 1998. Thermal marking of otoliths: the “RBr” coding structure of thermal marks. (NPAFC Doc. 367). 19 p. Alaska Dept. of Fish and Game, Juneau Alaska.

Table 1. Summary of thermal mark codes to be applied to Alaska hatchery salmon in brood year 2008.

SPECIES: SOCKEYE

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK08-01	TM	2008	2009	Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Hidden Lake
AK08-02	TM	2008	2010	Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake
AK08-03	TM	2008	2010	Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	English Bay Lakes
AK08-04	TM	2008	2009	Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Tatsamenie Lake
AK08-05	TM	2008	2009	Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Tatsamenie Lake
AK08-06	TM	2008	2009	Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Tatsamenie Lake
AK08-07	TM	2008	2010	Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Snettisham
AK08-08	TM	2008	2009	Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Hidden Lake
AK08-09	TM	2008	2009	Sockeye	Alaska	Southcentral	PWSAC	Main Bay Hatchery	Main Bay
AK08-10	TM	2008	2009	Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	English Bay Lakes
AK08-11	TM	2008	2010	Sockeye	Alaska	Southeast	SSRAA	Bumett Inlet Hatchery	McDonald Lake
AK08-12	TM	2008	2009	Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Snettisham
AK08-13	TM	2008	2010	Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Snettisham
AK08-14	TM	2008	2010	Sockeye	Alaska	Southeast	SSRAA	Bumett Inlet Hatchery	McDonald Lake
AK08-15	TM	2008	2009	Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Tahltan Lake
AK08-16	TM	2008	2010	Sockeye	Alaska	Southcentral	PWSAC	Main Bay Hatchery	Main Bay
AK08-17	TM	2008	2009	Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Hidden Lake
AK08-18	TM	2008	2009	Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake
AK08-19	SM	2008	2009	Sockeye	Alaska	Southcentral	PWSAC	Gulkana	Gulkana

ID#	MARK NAME	STAGE	ESIMATED RELEASE	HATCH CODE	RBr CODE	Pre-Hatch Graphic	Post-Hatch Graphic	MARKING SYSTEM	TEMP SHIFT DIRECTION
AK08-01	HIDDENLAKE08	Fry	530,000	2,1,2H	1:1.2,2.1,3.2			Boiler	Up
AK08-02	TRAILLAKES08B	Smolt	2,000,000	2,1H	1:1.2,2.1			Boiler	Up
AK08-03	ENGLISH BAY08SMOLT	Smolt	300,000	2,5H	1:1.2,2.5			Boiler	Up
AK08-04	TATSAMENIE08ER	Fry	400,000	2,6H	1:1.2,2.6			Chiller	Down
AK08-05	TATSAMENIE08N	Fry	1,300,000	3,2H	1:1.3,2.2			Chiller	Down
AK08-06	TATSAMENIE08S	Fry	1,300,000	3,3H	1:1.3,2.3			Chiller	Down
AK08-07	SPEELARM08B	Smolt	1,000,000	3n,4H	1:1.3n,2.4			Chiller	Down
AK08-08	TUTKA08	Fry	530,000	4,2H	1:1.4,2.2			Boiler	Up
AK08-09	SOLFLAKE08	Fry	150,000	4,2H5	1:1.4,2.2+3.5			Boiler	Up
AK08-10	ENGLISH BAY08	Pre-smolt	150,000	4H	1:1.4			Boiler	Up
AK08-11	BURNETT08	Smolt	250,000	4n,2H	1:1.4n,2.2			Chiller	Down
AK08-12	SWEETHEART08	Fry	500,000	5,2H	1:1.5,2.2			Chiller	Down
AK08-13	SPEELARM08A	Smolt	8,000,000	5H	1:1.5			Chiller	Down
AK08-14	MCDONALD08	Smolt	400,000	5n,3H	1:1.5n,2.3			Chiller	Down
AK08-15	TAHLTAN08	Fry	2,500,000	6H	1:1.6			Chiller	Down
AK08-16	MAINBAY08	Smolt	8,000,000	7H	1:1.7			Boiler	Up
AK08-17	PENINSULA08SOCKEYE	Fry	3,500,000	H2,2	2:1.2,2.2			Boiler	Up
AK08-18	TRAILLAKES08A	Fry	2,400,000	H4	2:1.4			Boiler	Up
AK08-19	GULKANA08	Fry	22,000,000	HS1	2:1.S1			Immersion	

Table 1 (continued). Summary of thermal mark codes to be applied to Alaska hatchery salmon in brood year 2008.

SPECIES: PINK

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK08-20	TM	2008	2009	Pink	Alaska	Southeast	KAKE	Gunnuk Creek	Gunnuk Cr
AK08-21	TM	2008	2009	Pink	Alaska	Southeast	AKI	Port Armstrong Hatchery	Port Armstrong
AK08-22	TM	2008	2009	Pink	Alaska	Southcentral	PWSAC	Cannery Creek Hatchery	Cannery Creek
AK08-23	TM	2008	2009	Pink	Alaska	Southeast	SJ	Sheldon Jackson	Sheldon Jackson
AK08-24	TM	2008	2009	Pink	Alaska	Southcentral	PWSAC	Armin F. Koernig Hatchery	Armin F. Koernig
AK08-25	TM	2008	2009	Pink	Alaska	Southcentral	PWSAC	Armin F. Koernig Hatchery	Armin F. Koernig
AK08-26	TM	2008	2009	Pink	Alaska	Southcentral	PWSAC	Armin F. Koernig Hatchery	Armin F. Koernig
AK08-27	TM	2008	2009	Pink	Alaska	Southcentral	VFDA	Solomon Gulch Hatchery	Solomon Gulch
AK08-28	TM	2008	2009	Pink	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK08-29	TM	2008	2009	Pink	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK08-30	TM	2008	2009	Pink	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg

ID#	MARK NAME	STAGE	ESIMATED RELEASE	HATCH CODE	RBr CODE	Pre-Hatch Graphic	Post-Hatch Graphic	MARKING SYSTEM	TEMP SHIFT DIRECTION
AK08-20	KAKE08PINK	Fed Fry	5,000,000	1,2,1H	1:1.1,2,2,3,1			Chiller	Down
AK08-21	PORTARMSTRONG08	Fed Fry	24,000,000	1,4H	1:1.1,2,4			Boiler	Up
AK08-22	CCH08	Fed Fry	140,000,000	3,3H	1:1.3,2,3			Boiler	Up
AK08-23	SJ08PINK	Fed Fry	100,000	4,1H	1:1.4,2,1			Chiller	Down
AK08-24	AFK08A	Fed Fry	50,000,000	4H	1:1.4			Boiler	Up
AK08-25	AFK08B	Fed Fry	50,000,000	4H3	1:1.4+2.3			Boiler	Up
AK08-26	AFK08C	Fed Fry	50,000,000	4H5	1:1.4+2.5			Boiler	Up
AK08-27	SGH08	Fed Fry	200,000,000	6H	1:1.6			Boiler	Up
AK08-28	WHN08PINKA	Fed Fry	40,000,000	8H	1:1.8			Boiler	Up
AK08-29	WHN08PINKB	Fed Fry	40,000,000	8H3	1:1.8+2.3			Boiler	Up
AK08-30	WHN08PINKC	Fed Fry	40,000,000	8H5	1:1.8+2.5			Boiler	Up

Table 1 (continued). Summary of thermal mark codes to be applied to Alaska hatchery salmon in brood year 2008.

SPECIES: CHUM

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK08-31	TM	2008	2009	Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK08-32	TM	2008	2009	Chum	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK08-33	TM	2008	2009	Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK08-34	TM	2008	2009	Chum	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK08-35	TM	2008	2009	Chum	Alaska	Southeast	NSRAA	Hidden Falls Hatchery	Hidden Falls
AK08-36	TM	2008	2009	Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK08-37	TM	2008	2009	Chum	Alaska	Southeast	NSRAA	Medvejie Hatchery	Hidden Falls
AK08-38	TM	2008	2009	Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK08-39	TM	2008	2009	Chum	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK08-40	TM	2008	2009	Chum	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK08-41	TM	2008	2009	Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK08-42	TM	2008	2009	Chum	Alaska	Southeast	KAKE	Gunnuk Creek	Gunnuk Cr
AK08-43	TM	2008	2009	Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK08-44	TM	2008	2009	Chum	Alaska	Western	NSED	Nome Incubation	Solomon River
AK08-45	TM	2008	2009	Chum	Alaska	Southeast	NSRAA	17 Mile Incubation Site	Chilkat
AK08-46	TM	2008	2009	Chum	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK08-47	TM	2008	2009	Chum	Alaska	Southeast	NSRAA	Hidden Falls Hatchery	Hidden Falls
AK08-48	TM	2008	2009	Chum	Alaska	Southeast	SJ	Sheldon Jackson	Sheldon Jackson
AK08-49	TM	2008	2009	Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK08-50	TM	2008	2009	Chum	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay
AK08-51	TM	2008	2009	Chum	Alaska	Southeast	AKI	Port Armstrong Hatchery	Port Armstrong

ID#	MARK NAME	STAGE	ESIMATED RELEASE	HATCH CODE	RBr CODE	Pre-Hatch Graphic	Post-Hatch Graphic	MARKING SYSTEM	TEMP SHIFT DIRECTION
AK08-31	ANITABAY08	Fed Fry	22,000,000	1,3,4H	1:1.1,2.3,3.4			Boiler	Up
AK08-32	DEEPINLETM08	Fed Fry	49,000,000	3,1,3H	1:1.3,2.1,3,3			Chiller	Down
AK08-33	NAKATINLET08SUM	Fed Fry	8,000,000	3,2,3H	1:1.3,2.2,3,3			Boiler	Up
AK08-34	WHN_AFK08	Fed Fry	15,000,000	3,2nH	1:1.3,2.2n			Boiler	Up
AK08-35	HIDDENFALLS08	Fed Fry	53,000,000	3,3,1H	1:1.3,2.3,3,1			Lake Intakes	Up
AK08-36	NAKATINLET08FALL	Fed Fry	8,000,000	3,4,1H4	1:1.3,2.4,3,1+4.4			Boiler	Up
AK08-37	DEEPINLETHF08	Fed Fry	22,000,000	3n,2,2nH	1:1.3n,2.2,3,2n			Lake Intakes	Up
AK08-38	KENDRICK08A	Fed Fry	18,000,000	4,1,2,1H	1:1.4,2.1,3,2,4,1			Boiler	Up
AK08-39	PORTCHALMERS08	Fed Fry	40,000,000	4,1H	1:1.4,2,1			Boiler	Up
AK08-40	BEARCOVE08	Fed Fry	9,000,000	4,2,1H	1:1.4,2.2,3,1			Heater	Up
AK08-41	NEETSBAY08FALL	Fed Fry	18,000,000	4,2,2H4	1:1.4,2.2,3,2+4.4			Boiler	Up
AK08-42	KAKE08	Fed Fry	25,000,000	4,2H	1:1.4,2,2			Chiller	Down
AK08-43	NEETSBAY08SUM	Fed Fry	49,000,000	4,4H4	1:1.4,2.4+3,4			Boiler	Up
AK08-44	NORTON08CHUMB	Egg	126,000	4H	1:1.4			Moist Air	Up
AK08-45	17MILE08	Fed Fry	800,000	4H	1:1.4			Heater	Up
AK08-46	WHN08	Fed Fry	75,000,000	5,2nH	1:1.5,2,2n			Boiler	Up
AK08-47	TAKATZ08	Fed Fry	45,000,000	5,3H	1:1.5,2,3			Lake Intakes	Up
AK08-48	SJ08CHUM	Fed Fry	100,000	6,1H	1:1.6,2,1			Chiller	Down
AK08-49	KENDRICK08B	Fed Fry	2,000,000	6,2H	1:1.6,2,2			Boiler	Up
AK08-50	DIPAC08	Fed Fry	100,000,000	6H	1:1.6			Boiler	Up
AK08-51	PORTARMSTRONG08CHUM	Fed Fry	13,000,000	H5	2:1.5			Boiler	Up

Table 1 (continued). Summary of thermal mark codes to be applied to Alaska hatchery salmon in brood year 2008.

SPECIES: COHO

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK08-52	TM	2008	2010	Coho	Alaska	Southeast	SSRAA	Burnett Inlet Hatchery	Burnett Inlet
AK08-53	TM	2008	2010	Coho	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Ship Creek
AK08-54	TM	2008	2010	Coho	Alaska	Southeast	SSRAA	Burnett Inlet Hatchery	Burnett Inlet
AK08-55	TM	2008	2010	Coho	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Bear Lake
AK08-56	TM	2008	2010	Coho	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK08-57	TM	2008	2009	Coho	Alaska	Western	NSED	Nome Incubation	Snake River
AK08-58	TM	2008	2010	Coho	Alaska	Southcentral	VFDA	Soloimon Gulch Hatchery	Solomon Gulch
AK08-59	TM	2008	2010	Coho	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake
AK08-60	TM	2008	2009	Coho	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake

ID#	MARK NAME	STAGE	ESIMATED RELEASE	HATCH CODE	RBr CODE	Pre-Hatch Graphic	Post-Hatch Graphic	MARKING SYSTEM	TEMP SHIFT DIRECTION
AK08-52	NECKLAKE08COHO	Smolt	1,650,000	1,4H	1:1.1,2,4			Chiller	Down
AK08-53	COOKINLET08COHO	Smolt	655,000	1,5H	1:1.1,2,5			Chiller	Down
AK08-54	BURNETTINLET08COHO	Smolt	200,000	2,1,2H	1:1.2,2.1,3,2			Chiller	Down
AK08-55	RESUR RECTION08COHO	Smolt	240,000	2,4H	1:1.2,2,4			Chiller	Down
AK08-56	WHN08COHO	Smolt	1,000,000	3H	1:1.3			Boiler	Up
AK08-57	NORTON08COHO	Egg	200,000	4H	1:1.4			Moist Air	Up
AK08-58	SGH08COHO	Smolt	1,500,000	6H	1:1.6			Boiler	Up
AK08-59	TRAILLAKES08LGC0HO	Smolt	150,000	H5	2:1.5			Boiler	Up
AK08-60	TRAILLAKES08SMCOHO	Fry	405,000	H7	2:1.7			Boiler	Up

SPECIES: CHINOOK

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK08-61	TM	2008	2010	Chinook	Alaska	Southeast	SSRAA	Whitman Lake Hatchery	Whitman Lake
AK08-62	TM	2008	2010	Chinook	Alaska	Southeast	SSRAA	Whitman Lake Hatchery	Whitman Lake
AK08-63	TM	2008	2010	Chinook	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Cook Inlet
AK08-64	TM	2008	2010	Chinook	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Ship Creek
AK08-65	TM	2008	2010	Chinook	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK08-66	TM	2008	2010	Chinook	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Crooked Creek
AK08-67	TM	2008	2009	Chinook	Alaska	Southcentral	CVEP	Chickaloon Incubation	Moose River
AK08-68	TM	2008	2009	Chinook	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK08-69	TM	2008	2009	Chinook	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK08-70	TM	2008	2010	Chinook	Alaska	Southeast	NSRAA	Hidden Falls Hatchery	Hidden Falls
AK08-71	TM	2008	2010	Chinook	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie

ID#	MARK NAME	STAGE	ESIMATED RELEASE	HATCH CODE	RBr CODE	Pre-Hatch Graphic	Post-Hatch Graphic	MARKING SYSTEM	TEMP SHIFT DIRECTION
AK08-61	NEETSBAY08CHIN	Smolt	650,000	1,5H	1:1.1,2,5			Boiler	Up
AK08-62	WHITMAN08CHIN	Smolt	725,000	1,5H	1:1.1,2,5			Boiler	Up
AK08-63	COOKINLET08CHIN	Smolt	1,085,000	2,3H	1:1.2,2,3			Chiller	Down
AK08-64	PW S08CHIN	Smolt	315,000	2,4H	1:1.2,2,4			Chiller	Down
AK08-65	GREENLAKE08CHIN	Smolt	850,000	2,4nH	1:1.2,2,4n			Chiller	Down
AK08-66	RESUR RECTION08CHIN	Smolt	210,000	2,5H	1:1.2,2,5			Chiller	Down
AK08-67	CHICKALOON08	Egg	100,000	3,2H	1:1.3,2,2			Moist Air	Up
AK08-68	DEEPINLET08CHINZ	Smolt	1,000,000	3,3H	1:1.3,2,3			Chiller	Down
AK08-69	MEDVEJIE08CHINZ	Smolt	1,000,000	4,1H	1:1.4,2,1			Chiller	Down
AK08-70	HIDDENFALLS08CHIN	Smolt	1,500,000	4,2H	1:1.4,2,2			Lake Intakes	Up
AK08-71	MEDVEJIE08CHIN	Smolt	1,000,000	4,4H	1:1.4,2,4			Chiller	Down