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Proposed Thermal Marks for Brood Year 2005 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 2005, we plan to mark approximately 41.4 million sockeye, 6.2 million chinook, 539 million chum, 8.2 million coho, and 730 million pink salmon. Salmon will be marked at 22 different hatcheries using 76 thermal marks.

Introduction

In Alaska, the primary use of thermal marking is 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. Several on-going programs use this mark-recovery information as an aid to the in-season management of mixed stock fisheries, and hatcheries use the information to evaluate the success of various rearing and release strategies. In addition, thermal marks are being used to determine the origin of juvenile and immature salmon collected during biotic 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 2005 brood year stocks

The proposed thermal marks for brood year 2005 salmon are listed in Table 1. We plan to mark approximately 41.4 million sockeye, 6.2 million chinook, 539 million chum, 8.2 million coho, and 730 million pink salmon. Salmon will be marked at 20 different hatcheries using 76 thermal mark patterns. The proposed otolith plan shows how some marks are scheduled to change in future years. 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), with the modification by Hagen (1999) to include narrow ring bands, as well as in the Hatch Code notation.

References

- Hagen, P. 1999. A modeling approach to address the underlying structure and constraints of thermal mark codes and code notation. (NPAFC Doc. 395). 12 p. 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 2005.

SPECIES: CHINOOK

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	DATE LAST RELEASED	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK05-80	TM	2005	2006		Chinook	Alaska	Southcentral	SSLC	Seward Sealife Center	Ressurrection Bay
AK05-01	TM	2005	2007		Chinook	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Cook Inlet
AK05-02	TM	2005	2007		Chinook	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Ship Creek
AK05-03	TM	2005	2007		Chinook	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Ressurrection Bay
AK05-04	TM	2005	2007		Chinook	Alaska	Southcentral	SSLC	Seward Sealife Center	Ressurrection Bay
AK05-07	TM	2005	2006		Chinook	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK05-05	TM	2005	2007		Chinook	Alaska	Southeast	NSRAA	Hidden Falls Hatchery	Hidden Falls
AK05-08	TM	2005	2007		Chinook	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK05-79	TM	2005	2006		Chinook	Alaska	Southcentral	SSLC	Seward Sealife Center	Ressurrection Bay
AK05-06	TM	2005	2007		Chinook	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay

ID#	MARK NAME	STAGE	WEIGHT	LENGTH	ESIMATED RELEASE	RBr CODE	HATCH CODE	Pre-Hatch Graphic	Post-Hatch Graphic	COMMENTS
AK05-80	SEALIFE05CHIN				105,000	1:1.1,2.6	1,6H	I I I I I I		
AK05-01	COOKINLET05CHIN				1,090,000	1:1.2,2.3	2,3H	II III		
AK05-02	PWS05CHIN				315,000	1:1.2,2.4	2,4H	II IIII		
AK05-03	RESURRECTION05CHIN				105,000	1:1.2,2.5	2,5H	II I I I I I		
AK05-04	SEALIFE05CHIN				105,000	1:1.3,2.3,3.1	3,3,1H	III III I		
AK05-07	GREENLAKE05CHIN				1,000,000	1:1.3,2.3	3,3H	III III		
AK05-05	HIDDENFALLS05CHIN				1,500,000	1:1.4,2.2	4,2H	IIII II		
AK05-08	MEDVEJIE05				1,300,000	1:1.4,2.3	4,3H	IIII III		
AK05-79	SEALIFE05CHIN				105,000	1:1.4,2.3	4,3H	IIII III		
AK05-06	DIPAC05CHIN				600,000	2:1.6	H6		IIIIII	

SPECIES: COHO

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	DATE LAST RELEASED	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK05-32	TM	2005	2007		Coho	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Ship Creek
AK05-34	TM	2005	2007		Coho	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay
AK05-33	TM	2005	2007		Coho	Alaska	Southcentral	ADFG	Fort Richardson Hatchery	Bear Lake
AK05-36	TM	2005	2007		Coho	Alaska	Southeast	AKI	Port Armstrong Hatchery	Port Armstrong
AK05-38	TM	2005	2006		Coho	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake
AK05-39	TM	2005	2006		Coho	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake
AK05-40	TM	2005	2007		Coho	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK05-35	TM	2005	2007		Coho	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK05-37	TM	2005	2007		Coho	Alaska	Southcentral	VFDA	Solomon Gulch Hatchery	Solomon Gulch

ID#	MARK NAME	STAGE	WEIGHT	LENGTH	ESIMATED RELEASE	RBr CODE	HATCH CODE	Pre-Hatch Graphic	Post-Hatch Graphic	COMMENTS
AK05-32	COOKINLET05COHO				640,000	1:1.1,2.5	1,5H	I I I I I I		
AK05-34	DIPAC05COHO				800,000	1:1.2,2.2	2,2H	II II		
AK05-33	RESURRECTION05COHO				240,000	1:1.2,2.4	2,4H	II IIII		
AK05-36	PORTARMSTRONG05COHO				1,600,000	1:1.3,2.2	3,2H	III II		
AK05-38	TRAILLAKES05SMCOHO				450,000	1:1.3,2.3	3,3H	III III		
AK05-39	TRAILLAKES05LGCOHO				150,000	1:1.3,2.3	3,3H	III III		
AK05-40	WHN05COHO				300,000	1:1.3	3H	III		
AK05-35	MEDVEJIE05COHO				2,500,000	1:1.4,2.2	4,2H	IIII II		
AK05-37	SGH05COHO				1,500,000	1:1.6	6H	IIIIII		

Table 1 (continued). Summary of thermal mark codes to be applied to Alaska hatchery salmon in brood year 2005.

SPECIES: CHUM

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	DATE LAST RELEASED	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK05-31	TM	2005	2006		Chum	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK05-30	TM	2005	2006		Chum	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK05-12	TM	2005	2006		Chum	Alaska	Southeast	NSRAA	Hidden Falls Hatchery	Hidden Falls
AK05-23	TM	2005	2006		Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK05-21	TM	2005	2006		Chum	Alaska	Southeast	SSRAA	Medvejie Hatchery	Hidden Falls
AK05-25	TM	2005	2006		Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK05-22	TM	2005	2006		Chum	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK05-27	TM	2005	2006		Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK05-77	TM	2005	2006		Chum	Alaska	Southeast	KAKE	Gunnuk Creek	Gunnuk Cr
AK05-29	TM	2005	2006		Chum	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK05-13	TM	2005	2006		Chum	Alaska	Southeast	NSRAA	Hidden Falls Hatchery	Hidden Falls
AK05-26	TM	2005	2006		Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK05-11	TM	2005	2006		Chum	Alaska	Southeast	NSRAA	Hidden Falls Hatchery	Hidden Falls
AK05-20	TM	2005	2006		Chum	Alaska	Southeast	NSRAA	Medvejie Hatchery	Hidden Falls
AK05-09	TM	2005	2006		Chum	Alaska	Western	ADFG	Nome Chum Incubation	Nome
AK05-78	TM	2005	2006		Chum	Alaska	Southeast	NSRAA	Medvejie Hatchery	Medvejie
AK05-10	TM	2005	2006		Chum	Alaska	Southeast	NSRAA	Herman Creek	Chilkat
AK05-24	TM	2005	2006		Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK05-28	TM	2005	2006		Chum	Alaska	Southeast	SSRAA	Neets Bay Hatchery	Neets Bay
AK05-14	TM	2005	2006		Chum	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay
AK05-15	TM	2005	2006		Chum	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay
AK05-16	TM	2005	2006		Chum	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay
AK05-17	TM	2005	2006		Chum	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay
AK05-18	TM	2005	2006		Chum	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay
AK05-19	TM	2005	2006		Chum	Alaska	Southeast	DIPAC	Macaulay Hatchery	Macaulay

ID#	MARK NAME	STAGE	WEIGHT	LENGTH	ESIMATED RELEASE	RBr CODE	HATCH CODE	Pre-Hatch Graphic	Post-Hatch Graphic	COMMENTS
AK05-31	WHN05B				35,000,000	1:1.1,2.2,3.1,4.2	1,2,1,2H			
AK05-30	PORTCHALMERS05				40,000,000	1:1.1,2.2n,3.3	1,2n,3H			
AK05-12	HIDDENFALLS05LL				15,000,000	1:1.1,2.3,3.2,4.1	1,3,2,1H			
AK05-23	ANITABAY05				14,000,000	1:1.1,2.3,3.3,4.1	1,3,3,1H			
AK05-21	DEEPINLETF05LL				7,000,000	1:1.1,2.3,3.3	1,3,3H			
AK05-25	NAKATINLET05FALL				8,000,000	1:1.1,2.3,3.4	1,3,4H			
AK05-22	DEEPINLETMJ05LL				9,000,000	1:1.1,2.3n,3.3	1,3n,3H			
AK05-27	NEETSBA05SUM				47,000,000	1:1.1,2.4,3.3	1,4,3H			
AK05-77	GUNNUK05					1:1.1,2.5,3.1	1,5,1H			
AK05-29	WHN05				75,000,000	1:1.1,2.5	1,5H			
AK05-13	TAKATZ05				45,000,000	1:1.3,2.1,3.2,4.1	3,1,2,1H			
AK05-26	NAKATINLET05SUM				8,000,000	1:1.3,2.2,3.3	3,2,3H			
AK05-11	HIDDENFALLS05				38,000,000	1:1.3,2.3,3.1	3,3,1H			
AK05-20	DEEPINLETF05				15,000,000	1:1.3n,2.2,3.2n	3n,2,2nH			
AK05-09	NOME05				20,000	1:1.3n,2.2	3n,2H			
AK05-78	DEEPINLETMJ05LL				40,000,000	1:1.3n,2.2n,3.2	3n,2n,2H			
AK05-10	CHILKAT05				500,000	1:1.3n,2.4	3n,4H			
AK05-24	KENDRICKBAY05				18,000,000	1:1.4,2.1,3.2,4.1	4,1,2,1H			
AK05-28	NEETSBA05FALL				20,000,000	1:1.4,2.1,3.3	4,1,3H			
AK05-14	AMALGA05A				40,000,000	1:1.6+2.2	6H2			
AK05-15	AMALGA05B				8,000,000	1:1.6+2.2	6H2			
AK05-16	BOATHARBOR05				15,000,000	1:1.6+2.2	6H2			
AK05-17	GASTINEAU05A				20,000,000	1:1.6+2.2	6H2			
AK05-18	GASTINEAU05B				7,000,000	1:1.6+2.2	6H2			
AK05-19	LIMESTONE05				15,000,000	1:1.6+2.2	6H2			

Table 1 (continued). Summary of thermal mark codes to be applied to Alaska hatchery salmon in brood year 2005.

SPECIES: SOCKEYE

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	DATE LAST RELEASED	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK05-70	TM	2005	2006		Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake
AK05-73	TM	2005	2006		Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Hidden Lake
AK05-55	TM	2005	2007		Sockeye	Alaska	Southeast	SSRAA	Burnett Inlet Hatchery	McDonald Lake
AK05-54	TM	2005	2007		Sockeye	Alaska	Southeast	SSRAA	Burnett Inlet Hatchery	McDonald Lake
AK05-57	TM	2005	2006		Sockeye	Alaska	Southeast	POWHA	Klawock River Hatchery	Klawock Lake
AK05-58	TM	2005	2007		Sockeye	Alaska	Southcentral	PWSAC	Main Bay Hatchery	Main Bay
AK05-60	TM	2005	2007		Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Snettisham
AK05-71	TM	2005	2007		Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake
AK05-72	TM	2005	2006		Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	
AK05-65	TM	2005	2006		Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Tahltan Lake
AK05-59	TM	2005	2006		Sockeye	Alaska	Southcentral	PGHC	Port Graham	English Bay Lake
AK05-67	TM	2005	2006		Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Tatsamenie Lake
AK05-66	TM	2005	2006		Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Tahltan Lake
AK05-68	TM	2005	2006		Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Tatsamenie Lake
AK05-64	TM	2005	2006		Sockeye	Alaska	Southeast	DIPAC	Snettisham Hatchery	Snettisham
AK05-69	TM	2005	2006		Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Bear Lake
AK05-75	TM	2005	2006		Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	English Bay Lake
AK05-76	TM	2005	2006		Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	English Bay Lake
AK05-74	TM	2005	2006		Sockeye	Alaska	Southcentral	CIAA	Trail Lakes Hatchery	Big Lake
AK05-56	TM	2005	2006		Sockeye	Alaska	Southcentral	PWSAC	Gulkana	Gulkana

ID#	MARK NAME	STAGE	WEIGHT	LENGTH	ESIMATED RELEASE	RBr CODE	HATCH CODE	Pre-Hatch Graphic	Post-Hatch Graphic	COMMENTS
AK05-70	TRAILLAKES05B				700,000	1:1.2,2.1	2,1H			
AK05-73	HIDDENLAKE05				600,000	1:1.2,2.2,3.2	2,2,2H			
AK05-55	NECKLAKE05				500,000	1:1.2,2.6n	2,6nH			
AK05-54	BURNETTINLET05				40,000	1:1.2,2.6n+3.4	2,6nH4			
AK05-57	KLAWOCK05				300,000	1:1.3,2.2	3,2H			
AK05-58	MAINBAY05				8,000,000	1:1.3,2.3+3.3	3,3H3			
AK05-60	SPEELARM05				6,000,000	1:1.3,2.4n	3,4nH			
AK05-71	TRAILLAKES05C				250,000	1:1.3	3H			
AK05-72	PENINSULA05SOCKEYE				6,000,000	1:1.3	3H			
AK05-65	TAHLTAN05				1,500,000	1:1.4,2.2	4,2H			
AK05-59	ENGLISHBAYLAKE05				200,000	1:1.4+2.2,3.2	4H2,2			
AK05-67	TATSAMENIE05S				1,000,000	1:1.4+2.3	4H3			
AK05-66	TUYA05				3,000,000	1:1.4+2.4	4H4			
AK05-68	TATSAMENIE05N				1,000,000	1:1.4+2.5	4H5			
AK05-64	SWEETHEART05				526,000	1:1.5,2.2	5,2H			
AK05-69	TRAILLAKES05A				1,000,000	1:1.6	6H			
AK05-75	PORTGRAHAM05SOCKEYE				650,000	2:1.2,2.3	H2,3			
AK05-76	TUTKASOCKEYE05				650,000	2:1.3,2.3	H3,3			
AK05-74	BIGLAKE05				1,500,000	2:1.4	H4			
AK05-56	GULKANA05				8,000,000	Sr:E1	Sr:E1			

Table 1 (continued). Summary of thermal mark codes to be applied to Alaska hatchery salmon in brood year 2005.

SPECIES: PINK

ID#	MARK TYPE	BROOD YEAR	RELEASE YEAR	DATE LAST RELEASED	SPECIES	STATE/ PROVINCE	REGION RELEASE	AGENCY	FACILITY	STOCK
AK05-45	TM	2005	2006		Pink	Alaska	Western	ADFG	Hobson Creek	Nome
AK05-44	TM	2005	2006		Pink	Alaska	Southcentral	PWSAC	Cannery Creek Hatchery	Cannery Creek
AK05-46	TM	2005	2006		Pink	Alaska	Southeast	AKI	Port Armstrong Hatchery	Port Armstrong
AK05-47	TM	2005	2006		Pink	Alaska	Southeast	AKI	Port Armstrong Hatchery	Port Armstrong
AK05-48	TM	2005	2006		Pink	Alaska	Southeast	AKI	Port Armstrong Hatchery	Port Armstrong
AK05-49	TM	2005	2006		Pink	Alaska	Southcentral	PGHC	Port Graham	Port Graham
AK05-41	TM	2005	2006		Pink	Alaska	Southcentral	PWSAC	Armin F. Koernig Hatchery	Armin F. Koernig
AK05-42	TM	2005	2006		Pink	Alaska	Southcentral	PWSAC	Armin F. Koernig Hatchery	Armin F. Koernig
AK05-43	TM	2005	2006		Pink	Alaska	Southcentral	PWSAC	Armin F. Koernig Hatchery	Armin F. Koernig
AK05-81	TM	2005	2006		Pink	Alaska	Southeast	SJ	Sheldon Jackson	Sheldon Jackson
AK05-50	TM	2005	2006		Pink	Alaska	Southcentral	VFDA	Solomon Gulch Hatchery	Solomon Gulch
AK05-51	TM	2005	2006		Pink	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK05-52	TM	2005	2006		Pink	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg
AK05-53	TM	2005	2006		Pink	Alaska	Southcentral	PWSAC	Wally H. Noerenberg Hatchery	Wally H. Noerenberg

ID#	MARK NAME	STAGE	WEIGHT	LENGTH	ESIMATED RELEASE	RBr CODE	HATCH CODE	Pre-Hatch Graphic	Post-Hatch Graphic	COMMENTS
AK05-45	HOBSON05				20,000	1:1.3,2.2	3,2H			
AK05-44	CCH05				140,000,000	1:1.3,2.3	3,3H			
AK05-46	PORTARMSTRONG05E				35,000,000	1:1.3	3H			
AK05-47	PORTARMSTRONG05M				35,000,000	1:1.3+2.3	3H3			
AK05-48	PORTARMSTRONG05L				15,000,000	1:1.3+2.4	3H4			
AK05-49	PORTGRAHAM05				35,000,000	1:1.4,2.2	4,2H			
AK05-41	AFK05A				50,000,000	1:1.4	4H			
AK05-42	AFK05B				50,000,000	1:1.4+2.3	4H3			
AK05-43	AFK05C				50,000,000	1:1.4+2.5	4H5			
AK05-81	SJ05				100,000	1:1.4,2.1	4,1H			
AK05-50	SGH05				200,000,000	1:1.6	6H			
AK05-51	WHN05PINKA				40,000,000	1:1.8	8H			
AK05-52	WHN05PINKB				40,000,000	1:1.8+2.3	8H3			
AK05-53	WHN05PINKC				40,000,000	1:1.8+2.5	8H5			