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Releases of Otolith Marked Salmon from Alaska in 2016

by

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Abstract

In Alaska, mass-marking of salmon using otolith thermal marking is an effective research and management tool for a variety of situations. This document reports the otolith mark patterns applied to hatchery-raised salmon stocks released in Alaska during 2016. It includes five species of salmon from brood years 2014 through 2016. Release numbers, mark patterns, and release locations are summarized.

Summary of Alaska Thermal Marking Programs

In Alaska, thermal marking of otoliths is primarily 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. In addition, several on-going programs use this information to aid in the in-season management of mixed stock fisheries. Hatcheries use mark recovery data to evaluate the success of various release strategies. In research applications, thermal marks have been used to answer questions regarding lake survival and straying rates of returning adults. The presence of otolith thermal marks is also being used to determine the origin of juvenile and immature salmon collected during biotic surveys in the Gulf of Alaska and the Bering Sea. In many instances, thermal marks are being applied by hatcheries in the absence of a directed sampling program. This applies primarily to coho and Chinook salmon, but it includes some sockeye releases as well. The reasons for this vary, but it primarily occurs in situations where the marks cost little to apply, and there is anticipation that a thermal mark recovery program will be implemented by the time the fish return.

Thermal mark patterns are assigned annually by the Alaska Department of Fish and Game with consideration based on the constraints of the hatchery, the need to identify specific stocks, and the existence of a program to recover and identify the thermal patterns. It has become increasingly difficult to create and apply unique patterns as the hatchery marking programs have expanded. Consequently, alternative marking strategies, such as the use of strontium chloride and calcein, are currently being explored.

In 2016, hatcheries in Alaska released the following numbers of otolith marked salmon: 7.7 million Chinook, 677 million chum, 13 million coho, 755 million pink, and 49 million sockeye. A list of otolith marks applied to hatchery-reared salmon released in 2016 is provided in Table 1. Thermal mark patterns are presented in the Uniform Hatch Code notation (Johnson et al. 2006).

The information presented in this report is based on release year, which is defined as when the fish is removed from artificial culture and released into the natural environment. The data includes fish from brood years 2014, 2015, and 2016. In some instances, fish from the same thermal mark group will be released over several years, so this list may not be comprehensive for each NPAFC number (e.g. a single NPAFC number may appear during multiple release years). Further information regarding thermal mark patterns and

numbers of released fish in Alaska is available from the Alaska Department of Fish and Game, Mark, Tag and Age Laboratory database (<http://taglab.org>) and from the NPAFC Working Group on Salmon Marking's Website (<http://npafc.taglab.org>).

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

Table 1. Releases of otolith marked salmon from Alaska in 2016.

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	MARK ID	HATCH CODE	STAGE	NUMBER RELEASED
AK14-90	2014	CHINOOK	Alaska	SOUTHEAST	MEDVEJIE	BEAR COVE, HALIBUT PT	5/22/2016	Thermal	GREENLAKE14CHIN	2,4nH	SMOLT	2,383,535
AK14-89	2014	CHINOOK	Alaska	SOUTHEAST	HIDDEN FALLS	KASNYKU BAY	5/10/2016	Thermal	HIDDENFALLS14CHIN	4,2H	SMOLT	588,842
AK14-96	2014	CHINOOK	Alaska	SOUTHCENTRAL	WALLY NOERENBERG	CHENEGA BAY, FLEMING SPIT, WHITTIER HBR	6/2/2016	Thermal	PWS14CHIN	2,4H	SMOLT	49,600
AK14-91	2014	CHINOOK	Alaska	SOUTHEAST	WHITMAN LAKE	CARROLL INLET, COFFMAN COVE, HERRING COVE, KETCHIKAN CR, NEETS BAY, PORT ST NICHOLAS CR	5/23/2016	Thermal	WHITMAN14CHIN	1,5H	SMOLT	2,069,185
AK14-80	2014	COHO	Alaska	SOUTHCENTRAL	WILLIAM JACK HERNANDEZ	SEWARD LAGOON	5/18/2016	Thermal	COOKINLET14COHO	2,4H	SMOLT	272,212
AK14-83	2014	COHO	Alaska	SOUTHEAST	SAWMILL CREEK	BEAR COVE, DEEP INLET	5/24/2016	Thermal	DEEPINLET14COHO	4H	SMOLT	878,692
AK14-84	2014	COHO	Alaska	SOUTHEAST	KLAWOCK	KLAWOCK ESTUARY, KLAWOCK LK	6/1/2016	Thermal	KLAWOCK14COHO	4,2H	SMOLT	4,347,528
AK14-86	2014	COHO	Alaska	SOUTHEAST	WHITMAN LAKE	NAKAT INLET	5/9/2016	Thermal	NAKAT14COHO	2,5H	SMOLT	538,179
AK14-82	2014	COHO	Alaska	SOUTHCENTRAL	WILLIAM JACK HERNANDEZ	BIRD CR, CAMPBELL CR, EKLUTNA TAILRACE, HOMER SPIT, SHIP CR	5/26/2016	Thermal	RESURRECTION14COHO	1,5H	SMOLT	720,981
AK14-81	2014	COHO	Alaska	SOUTHCENTRAL	SOLOMON GULCH	BOULDER BAY, SOLOMON GULCH	6/7/2016	Thermal	SGH14COHO	6H	SMOLT	1,913,395
AK14-78	2014	COHO	Alaska	SOUTHCENTRAL	TRAIL LAKES	BEAR CR, BEAR LK	5/16/2016	Thermal	TRAILLAKES14SMCOHO	2,6H	SMOLT	100,000
AK14-77	2014	COHO	Alaska	SOUTHCENTRAL	WALLY NOERENBERG	CHENEGA BAY, FLEMING SPIT, LAKE BAY, WHITTIER HBR	6/5/2016	Thermal	WNH14COHO	3H	SMOLT	3,340,000
AK14-29	2014	SOCKEYE	Alaska	WESTWARD	KITOI BAY	LITTLE KITOI BAY, LITTLE KITOI LK, OUZINKIE BOAT HARBOR	5/27/2016	Dry	KITOI14	5,4H	SMOLT	656,651
AK14-28	2014	SOCKEYE	Alaska	WESTWARD	PILLAR CREEK	TELROD COVE	5/25/2016	Dry	KODIAK14A	4,4H	SMOLT	628,898
AK14-03	2014	SOCKEYE	Alaska	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/20/2016	Thermal	MBH14A	5H3	SMOLT	1,780,000
AK14-04	2014	SOCKEYE	Alaska	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/20/2016	Thermal	MBH14B	5H2,2	SMOLT	1,920,000
AK14-05	2014	SOCKEYE	Alaska	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/11/2016	Thermal	MBH14C	5H5	SMOLT	2,070,000
AK14-06	2014	SOCKEYE	Alaska	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/11/2016	Thermal	MBH14D	5H3,3	SMOLT	2,040,000
AK14-07	2014	SOCKEYE	Alaska	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/11/2016	Thermal	MBH14E	5H	SMOLT	2,230,000
AK14-13	2014	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	SPEEL ARM	5/28/2016	Thermal	SPEELARM14A	5H	SMOLT	2,570,900
AK14-19	2014	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	SPEEL ARM	6/3/2016	Thermal	SPEELARM14B	3n,4,3H	SMOLT	1,285,300
AK14-24	2014	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	SPEEL ARM	5/29/2016	Thermal	SPEELARM14C	4n,4H	SMOLT	1,284,700
AK14-25	2014	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	SPEEL ARM	5/28/2016	Thermal	SPEELARM14D	5,4nH	SMOLT	3,214,400
AK14-14	2014	SOCKEYE	Alaska	SOUTHCENTRAL	TRAIL LAKES	RESURRECTION BAY	5/24/2016	Thermal	TRAILLAKES14B	1,3H	SMOLT	1,680,165
AK14-21	2014	SOCKEYE	Alaska	SOUTHCENTRAL	TRAIL LAKES	TUTKA BAY	5/23/2016	Thermal	TUTKA14	4,2H	SMOLT	531,625
AK15-97	2015	CHINOOK	Alaska	SOUTHCENTRAL	WILLIAM JACK HERNANDEZ	CROOKED CR, DECEPTION CR, EKLUTNA TAILRACE, HALIBUT CV LAG, HOMER SPIT, NINILCHIK R, SELDOVIA HBR	6/14/2016	Thermal	COOKINLET15CHIN	2,3H	SMOLT	1,212,697
AK15-93	2015	CHINOOK	Alaska	WESTERN	VILLAGE OF WHITE MOUNTAIN	FISH R		Thermal	FISH15	3,2H	EYED EGG	20,000
AK15-96	2015	CHINOOK	Alaska	SOUTHEAST	MEDVEJIE	BEAR COVE, CRAWFISH INLET	5/31/2016	Thermal	MEDVEJIE15CHIN	2,3nH	SMOLT	458,411

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Table 1 (continued). Releases of otolith marked salmon from Alaska in 2016.

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	MARK ID	HATCH CODE	STAGE	NUMBER RELEASED
AK15-100	2015	CHINOOK	Alaska	SOUTHCENTRAL	WILLIAM JACK HERNANDEZ	FLEMING SPIT, WHITTIER HBR	6/23/2016	Thermal	PWS15CHIN	2,4H	SMOLT	197,164
AK15-101	2015	CHINOOK	Alaska	SOUTHCENTRAL	WILLIAM JACK HERNANDEZ	SEWARD LAGOON	5/27/2016	Thermal	RESURRECTION15CHIN	2,5H	SMOLT	320,711
AK15-99	2015	CHINOOK	Alaska	SOUTHCENTRAL	WILLIAM JACK HERNANDEZ	SHIP CR	6/9/2016	Thermal	SHIPCREEK15CHINL	2,3H2,4	SMOLT	154,308
AK15-98	2015	CHINOOK	Alaska	SOUTHCENTRAL	WILLIAM JACK HERNANDEZ	SHIP CR	6/9/2016	Thermal	SHIPCREEK15CHINS	2,3H4,2	SMOLT	214,831
AK15-95	2015	CHINOOK	Alaska	SOUTHEAST	WHITMAN LAKE	KETCHIKAN CR	5/19/2016	Thermal	WHITMAN15CHIN	1,5H	SMOLT	37,400
AK15-67	2015	CHUM	Alaska	SOUTHEAST	BURNETT INLET	ANITA BAY	4/17/2016	Thermal	ANITABAY15	1,6H	FINGERLING	20,003,000
AK15-73	2015	CHUM	Alaska	SOUTHEAST	BURNETT INLET	ANITA BAY	4/29/2016	Thermal	ANITABAYLL15	4n,4H	FINGERLING	2,138,000
AK15-53	2015	CHUM	Alaska	SOUTHEAST	MEDVEJIE	BEAR COVE	4/16/2016	Thermal	BEARCOVE15	4,2,1H	FED FRY	13,444,189
AK15-54	2015	CHUM	Alaska	SOUTHEAST	MEDVEJIE	BEAR COVE	4/25/2016	Thermal	BEARCOVE15A	3,1,3H3	FED FRY	2,432,779
AK15-55	2015	CHUM	Alaska	SOUTHEAST	MEDVEJIE	BEAR COVE	4/28/2016	Thermal	BEARCOVE15LL	3n,5H	FED FRY	3,014,061
AK15-70	2015	CHUM	Alaska	SOUTHEAST	NEETS BAY	BURNETT INLET	4/15/2016	Thermal	BURNETTINLET15	3,5,3H	FINGERLING	5,348,587
AK15-75	2015	CHUM	Alaska	SOUTHEAST	NEETS BAY	BURNETT INLET	4/25/2016	Thermal	BURNETTINLET15FALL	7n,3H	FINGERLING	5,056,911
AK15-65	2015	CHUM	Alaska	SOUTHEAST	SAWMILL CREEK	CRAWFISH INLET	4/18/2016	Thermal	CRAWFISH15	6,3H	FED FRY	14,018,140
AK15-66	2015	CHUM	Alaska	SOUTHEAST	SAWMILL CREEK	CRAWFISH INLET	4/28/2016	Thermal	CRAWFISH15LL	4,6H	FED FRY	13,776,103
AK15-49	2015	CHUM	Alaska	SOUTHEAST	MEDVEJIE	DEEP INLET	4/13/2016	Thermal	DEEPINLETHF15	3n,2,2nH	FED FRY	20,373,245
AK15-46	2015	CHUM	Alaska	SOUTHEAST	MEDVEJIE	DEEP INLET	4/25/2016	Thermal	DEEPINLETMV15	3,1,3H	FED FRY	26,046,306
AK15-47	2015	CHUM	Alaska	SOUTHEAST	MEDVEJIE	DEEP INLET	5/10/2016	Thermal	DEEPINLETMV15LL	3,2,5H	FED FRY	3,735,211
AK15-57	2015	CHUM	Alaska	SOUTHEAST	MACAULAY	AMALGA HARBOR, BOAT HARBOR	5/26/2016	Thermal	DIPAC15	1,3H	FED FRY	52,273,300
AK15-58	2015	CHUM	Alaska	SOUTHEAST	MACAULAY	GASTINEAU CH, LIMESTONE IN, THANE	5/28/2016	Thermal	DIPAC15B	1,3H3	FED FRY	42,706,000
AK15-50	2015	CHUM	Alaska	SOUTHEAST	HIDDEN FALLS	KASNYKU BAY	5/4/2016	Thermal	HIDDENFALLS15	1,2,3H	FED FRY	35,599,703
AK15-52	2015	CHUM	Alaska	SOUTHEAST	HIDDEN FALLS	KASNYKU BAY	5/15/2016	Thermal	HIDDENFALLS15LL	3,3,2H	FED FRY	10,419,637
AK15-68	2015	CHUM	Alaska	SOUTHEAST	WHITMAN LAKE	KENDRICK BAY	5/1/2016	Thermal	KENDRICK15	5,3H	FINGERLING	29,352,000
AK15-77	2015	CHUM	Alaska	WESTERN	KITOI BAY	KITOI BAY	5/6/2016	Thermal	KITOI15CHUM	3,3,3H	FED FRY	15,269,262
AK15-78	2015	CHUM	Alaska	WESTERN	KITOI BAY	KITOI BAY	5/17/2016	Thermal	KITOI15CHUMA	3,2,4H	FED FRY	13,853,288
AK15-74	2015	CHUM	Alaska	SOUTHEAST	NEETS BAY	NAKAT INLET	4/25/2016	Thermal	NAKATINLET15FALL	3,4,1H	FINGERLING	8,210,053
AK15-72	2015	CHUM	Alaska	SOUTHEAST	WHITMAN LAKE	NAKAT INLET	4/13/2016	Thermal	NAKATINLET15SUM	3,1,4H	FINGERLING	8,286,781
AK15-71	2015	CHUM	Alaska	SOUTHEAST	NEETS BAY	NEETS BAY	4/21/2016	Thermal	NEETS BAY15FALL	4,2,2H	FINGERLING	17,411,617
AK15-69	2015	CHUM	Alaska	SOUTHEAST	NEETS BAY	NEETS BAY	4/21/2016	Thermal	NEETS BAY15SUM	4,4H	FINGERLING	62,364,081
AK15-76	2015	CHUM	Alaska	WESTERN	NORTON SOUND HATCHERY	SNAKE R, SOLOMON R	5/15/2016	Thermal	NORTON15CHUM	1,2,2nH	FRY	43,000
AK15-44	2015	CHUM	Alaska	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	4/10/2016	Thermal	PORTARMSTRONG15CHUM	3H4	FED FRY	17,596,086
AK15-45	2015	CHUM	Alaska	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	3/23/2016	Thermal	PORTARMSTRONG15CHUMA	3H6	FED FRY	17,348,427

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Table 1 (continued). Releases of otolith marked salmon from Alaska in 2016.

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	MARK ID	HATCH CODE	STAGE	NUMBER RELEASED
AK15-63	2015	CHUM	Alaska	SOUTHEAST	HIDDEN FALLS	SE COVE	5/27/2016	Thermal	SECOVE15	8,2H	FED FRY	29,441,527
AK15-64	2015	CHUM	Alaska	SOUTHEAST	HIDDEN FALLS	SE COVE	5/27/2016	Thermal	SECOVE15LL	8H	FED FRY	13,316,743
AK15-43	2015	CHUM	Alaska	SOUTHEAST	SHELDON JACKSON	CRESCENT BAY	4/29/2016	Thermal	SJ15CHUM	4,2n,1H	FED FRY	2,795,979
AK15-61	2015	CHUM	Alaska	SOUTHEAST	HIDDEN FALLS	TAKATZ BAY	5/2/2016	Thermal	TAKATZ15	5n,2H	FED FRY	31,032,302
AK15-62	2015	CHUM	Alaska	SOUTHEAST	HIDDEN FALLS	TAKATZ BAY	5/15/2016	Thermal	TAKATZ15LL	5n,4H	FED FRY	7,345,485
AK15-48	2015	CHUM	Alaska	SOUTHCENTRAL	WALLY NOERENBERG	LAKE BAY	5/13/2016	Thermal	WNH15A	6H	FED FRY	71,700,000
AK15-56	2015	CHUM	Alaska	SOUTHCENTRAL	A F KOERNIG	SAWMILL BAY	5/25/2016	Thermal	WNH15B	1,2,1H	FED FRY	23,200,000
AK15-60	2015	CHUM	Alaska	SOUTHCENTRAL	WALLY NOERENBERG	PORT CHALMERS	5/13/2016	Thermal	WNH15C	3,2n,1H	FED FRY	38,300,000
AK15-82	2015	COHO	Alaska	SOUTHCENTRAL	TRAIL LAKES	BEAR LK	6/21/2016	Thermal	TRAILLAKES15SMCOHO	4,3H	FINGERLING	446,600
AK15-30	2015	PINK	Alaska	SOUTHCENTRAL	A F KOERNIG	SAWMILL BAY	5/6/2016	Thermal	AFK15B	4H	FED FRY	136,000,000
AK15-37	2015	PINK	Alaska	SOUTHCENTRAL	CANNERY CREEK	CANNERY CR	5/17/2016	Thermal	CCH15	3,3H	FED FRY	158,000,000
AK15-33	2015	PINK	Alaska	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	4/19/2016	Thermal	PORTARMSTRONG15	3H	FED FRY	55,689,913
AK15-34	2015	PINK	Alaska	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	4/18/2016	Thermal	PORTARMSTRONG15A	3H4	FED FRY	19,421,103
AK15-35	2015	PINK	Alaska	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	4/13/2016	Thermal	PORTARMSTRONG15B	3H3	FED FRY	22,005,906
AK15-41	2015	PINK	Alaska	SOUTHCENTRAL	PORT GRAHAM	PORT GRAHAM	5/28/2016	Thermal	PORTGRAHAM15	5H3	FED FRY	1,310,762
AK15-36	2015	PINK	Alaska	SOUTHCENTRAL	SOLOMON GULCH	SOLOMON GULCH	5/16/2016	Thermal	SGH15	6H	FED FRY	226,063,710
AK15-32	2015	PINK	Alaska	SOUTHEAST	SHELDON JACKSON	CRESCENT BAY	4/29/2016	Thermal	SJ15PINK	3,2H	FED FRY	2,437,062
AK15-39	2015	PINK	Alaska	SOUTHCENTRAL	TUTKA BAY	TUTKA BAY	6/2/2016	Thermal	TUTKA15PINK	5,3H	FED FRY	11,433,515
AK15-31	2015	PINK	Alaska	SOUTHCENTRAL	WALLY NOERENBERG	LAKE BAY	5/4/2016	Thermal	WNH15PINKB	8H	FED FRY	123,000,000
AK15-01	2015	SOCKEYE	Alaska	SOUTHCENTRAL	GULKANA	CROSSWIND LK, PAXSON LK, SUMMIT LK	5/19/2016	Strontium	GULKANA15	HS1	FED FRY	16,004,000
AK15-16	2015	SOCKEYE	Alaska	SOUTHCENTRAL	TRAIL LAKES	HIDDEN LK	4/26/2016	Thermal	HIDDENLAKE15	3,2,1H	FRY	1,231,000
AK15-28	2015	SOCKEYE	Alaska	WESTERN	KITOI BAY	LITTLE KITOI LK	10/6/2016	Dry	KITOI15	6,3H	PRESMOLT	106,273
AK15-26	2015	SOCKEYE	Alaska	WESTERN	PILLAR CREEK	JENNIFER LK), RUTH LK, SPIRIDON LK	5/25/2016	Dry	KODIAK15	6H	FED FRY	2,435,878
AK15-08	2015	SOCKEYE	Alaska	SOUTHCENTRAL	TRAIL LAKES	KIRSCHNER LK	6/15/2016	Thermal	PENINSULA15SOCKEYE	H2,2	FED FRY	185,000
AK15-23	2015	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	SWEETHEART LK	5/14/2016	Thermal	SWEETHEART15	2,5H	FRY	467,900
AK15-20	2015	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	R-TAHLTAN LK	5/10/2016	Thermal	TAHLTAN15	1,4H	FRY	1,404,100
AK15-11	2015	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	R-TATSAMENIE LK	5/14/2016	Thermal	TATSAMENIE15	3n,2H	FRY	384,300
AK15-22	2015	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	R-TATSAMENIE LK	5/27/2016	Thermal	TATSAMENIE15SER	3,3H	FED FRY	86,200
AK15-02	2015	SOCKEYE	Alaska	SOUTHCENTRAL	TRAIL LAKES	BEAR LK	6/14/2016	Thermal	TRAILLAKES15A	4,2H	FED FRY	2,374,000
AK15-12	2015	SOCKEYE	Alaska	SOUTHEAST	SNETTISHAM	R-TAHLTAN LK	5/13/2016	Thermal	TUYA15	1,4H4	FRY	1,995,400
AK16-77	2016	CHUM	Alaska	WESTERN	NORTON SOUND HATCHERY	SNAKE R	10/7/2016	Thermal	NORTON16CHUMB	8H	ZYGOTE	113,000
AK16-91	2016	COHO	Alaska	WESTERN	NORTON SOUND HATCHERY	SNAKE R	12/13/2016	Thermal	NORTON16COHO	2,3H	ZYGOTE	101,000