

NPAFC
Doc. 1626
Rev. _____

Releases of Otolith Marked Salmon from Alaska in 2015

by

Dion S. Oxman

Alaska Department of Fish and Game
P.O. Box 115526
Juneau, Alaska 99811-5526

Submitted to the

NORTH PACIFIC ANADROMOUS FISH COMMISSION

by

United States of America

March 2016

THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:

Oxman, D.S. 2016. Releases of otolith marked salmon from Alaska in 2015. NPAFC Doc. 1626. 5 pp. Alaska Department of Fish and Game (Available at www.npafc.org).

Keywords: otolith, thermal mark, salmon, Alaska, releases

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 2015. It includes five species of salmon from brood years 2013 through 2015. 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 2015, hatcheries in Alaska released the following numbers of otolith marked salmon: 6.4 million Chinook, 605 million chum, 9.2 million coho, 770 million pink, and 58 million sockeye. A list of otolith marks applied to hatchery-reared salmon released in 2015 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 2013, 2014, and 2015. 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 2015.

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	MARK ID	HATCH CODE	STAGE	NUMBER RELEASED
AK13-82	2013	CHINOOK	ALASKA	SOUTHEAST	HIDDEN FALLS	KASNYKU BAY	5/15/2015	Thermal	HIDDENFALLS13CHIN	4,2H	SMOLT	674,433
AK13-83	2013	CHINOOK	ALASKA	SOUTHEAST	MEDVEJIE	BEAR COVE	4/20/2015	Thermal	GREENLAKE13CHIN	3,5H	SMOLT	785,553
AK13-84	2013	CHINOOK	ALASKA	SOUTHEAST	WHITMAN LAKE	COFFMAN CV, HERRING CV, KETCHIKAN, NEETS BAY, PORT ST NICHOLAS	5/19/2015	Thermal	WHITMAN13CHIN	1,5H	SMOLT	1,338,012
AK13-85	2013	CHINOOK	ALASKA	SOUTHEAST	MEDVEJIE	BEAR CV, HALIBUT PT	5/15/2015	Thermal	MEDVEJIE13CHIN	5,2H	SMOLT	583,453
AK13-89	2013	CHINOOK	ALASKA	SOUTHCENTRAL	WJ HERNANDEZ	CHENEGA BAY, COVE CR, FLEMING SPIT	6/2/2015	Thermal	PWS13CHIN	2,4H	SMOLT	225,091
AK13-71	2013	COHO	ALASKA	SOUTHCENTRAL	WALLY NOERENBERG	CHENEGA BAY, FLEMING SPIT, LAKE BAY, WHITTIER HBR	6/5/2015	Thermal	WNH13COHO	3H	SMOLT	370,000
AK13-72	2013	COHO	ALASKA	SOUTHCENTRAL	TRAIL LAKES	BEAR CR	5/21/2015	Thermal	TRAILLAKES13SMCOHO	3,3H	SMOLT	98,000
AK13-74	2013	COHO	ALASKA	SOUTHCENTRAL	WJ HERNANDEZ	BIRD CR, CAMPBELL CR, EKUTNA TAILRACE, HOMER SPIT, SHIP CR	6/1/2015	Thermal	COOKINLET13COHO	1,5H	SMOLT	693,179
AK13-75	2013	COHO	ALASKA	SOUTHCENTRAL	SOLOMON GULCH	BOULDER BAY, SOLOMON GULCH	6/1/2015	Thermal	SGH13COHO	6H	SMOLT	1,869,354
AK13-76	2013	COHO	ALASKA	SOUTHCENTRAL	WJ HERNANDEZ	SEWARD LAGOON	5/28/2015	Thermal	RESURRECTION13COHO	2,4H	SMOLT	279,546
AK13-77	2013	COHO	ALASKA	SOUTHEAST	SAWMILL CREEK	BEAR COVE, DEEP INLET	5/13/2015	Thermal	DEEPINLET13COHO	4H	SMOLT	1,027,181
AK13-78	2013	COHO	ALASKA	SOUTHEAST	KLAWOCK RIVER	KLAWOCK ESTUARY, KLAWOCK LK	6/1/2015	Thermal	KLAWOCK13COHO	4,2H	SMOLT	3,720,457
AK13-80	2013	COHO	ALASKA	SOUTHEAST	WHITMAN LAKE	NAKAT INLET	5/15/2015	Thermal	NAKAT13COHO	2,5H	SMOLT	578,000
AK13-03	2013	SOCKEYE	ALASKA	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/20/2015	Thermal	MBH13A	3H3	SMOLT	2,340,000
AK13-04	2013	SOCKEYE	ALASKA	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/20/2015	Thermal	MBH13B	3H2,2	SMOLT	2,250,000
AK13-05	2013	SOCKEYE	ALASKA	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/20/2015	Thermal	MBH13C	3H5	SMOLT	2,260,000
AK13-06	2013	SOCKEYE	ALASKA	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/20/2015	Thermal	MBH13D	3H3,3	SMOLT	2,240,000
AK13-07	2013	SOCKEYE	ALASKA	SOUTHCENTRAL	MAIN BAY	MAIN BAY	5/22/2015	Thermal	MBH13E	3H	SMOLT	1,640,000
AK13-13	2013	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	SPEEL ARM	5/29/2015	Thermal	SPEELARM13A	3,3nH	SMOLT	2,565,500
AK13-18	2013	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	SPEEL ARM	6/6/2015	Thermal	SPEELARM13B	3,7H	SMOLT	1,283,900
AK13-23	2013	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	SPEEL ARM	5/29/2015	Thermal	SPEELARM13C	4,4nH	SMOLT	1,276,500
AK13-24	2013	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	SPEEL ARM	5/27/2015	Thermal	SPEELARM13D	4,6nH	SMOLT	3,853,700
AK13-14	2013	SOCKEYE	ALASKA	SOUTHCENTRAL	TRAIL LAKES	RESURRECTION BAY	4/25/2015	Thermal	TRAILLAKES13B	2,4H	SMOLT	1,758,000
AK13-16	2013	SOCKEYE	ALASKA	SOUTHCENTRAL	TRAIL LAKES	TUTKA BAY	5/22/2015	Thermal	ENGLISHBAY13SMOLT	1,5H	SMOLT	523,500
AK13-20	2013	SOCKEYE	ALASKA	SOUTHCENTRAL	TRAIL LAKES	TUTKA BAY	5/22/2015	Thermal	TUTKA13	2,5H	SMOLT	523,500
AK13-27	2013	SOCKEYE	ALASKA	WESTWARD	PILLAR CREEK	ANTON LARSON BAY, JENNIFER LK, OUZINKIE BOAT HARBOR, RUTH LK, SPIRIDON LK, TELROD CV	6/3/2015	Dry	KODIAK13A	4,3,2H	SMOLT	948,092
AK13-28	2013	SOCKEYE	ALASKA	WESTWARD	KITOI BAY	LITTLE KITOI BAY & LK	5/27/2015	Dry	KITOI13	3,2H	SMOLT	652,460
AK14-90	2014	CHINOOK	ALASKA	SOUTHEAST	MEDVEJIE	BEAR COVE	6/15/2015	Thermal	GREENLAKE14CHIN	2,4nH	SMOLT	447,918

Continued

Table 1 (continued). Releases of otolith marked salmon from Alaska in 2015.

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	MARK ID	HATCH CODE	STAGE	NUMBER RELEASED
AK14-93	2014	CHINOOK	ALASKA	SOUTHCENTRAL	WJ HERNANDEZ	CROOKED CR, DECEPTION CR, EKLUTNA TAILRACE, HALIBUT CV LAG, HOMER SPIT, NINILCHIK R, SELDOVIA HBR	6/19/2015	Thermal	COOKINLET14CHIN	2,3H	SMOLT	1,322,124
AK14-94	2014	CHINOOK	ALASKA	SOUTHCENTRAL	WJ HERNANDEZ	SHIP CR	6/12/2015	Thermal	SHIPCREEK14CHINS	2,3H3,3	SMOLT	213,414
AK14-95	2014	CHINOOK	ALASKA	SOUTHCENTRAL	WJ HERNANDEZ	SHIP CR	6/12/2015	Thermal	SHIPCREEK14CHINL	2,3H2,2	SMOLT	151,832
AK14-96	2014	CHINOOK	ALASKA	SOUTHCENTRAL	WJ HERNANDEZ	FLEMING SPIT, WHITTIER	6/26/2015	Thermal	PWS14CHIN	2,4H	SMOLT	212,230
AK14-97	2014	CHINOOK	ALASKA	SOUTHCENTRAL	WJ HERNANDEZ	SEWARD LAGOON	6/4/2015	Thermal	RESURRECTION14CHIN	2,5H	SMOLT	298,542
AK14-101	2014	CHUM	ALASKA	SOUTHEAST	NEETS BAY	BURNETT INLET	4/25/2015	Thermal	BURNETTINLET14	5,4H4,3	FINGERLING	4,945,000
AK14-45	2014	CHUM	ALASKA	SOUTHEAST	SHELDON JACKSON	CRESCENT BAY	5/13/2015	Thermal	SJ14CHUM	6,1H	FED FRY	2,333,519
AK14-47	2014	CHUM	ALASKA	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	4/11/2015	Thermal	PORTARMSTRONG14CHUM	3H3	FED FRY	22,817,058
AK14-48	2014	CHUM	ALASKA	SOUTHEAST	MEDVEJIE	DEEP INLET	4/24/2015	Thermal	DEEPINLETMV14	3,3,3H	FED FRY	39,312,791
AK14-49	2014	CHUM	ALASKA	SOUTHEAST	MEDVEJIE	DEEP INLET	4/30/2015	Thermal	DEEPINLETMV14LL	6,3,2H	FED FRY	7,879,634
AK14-50	2014	CHUM	ALASKA	SOUTHCENTRAL	WALLY NOERENBERG	LAKE BAY	5/17/2015	Thermal	WNH14A	3,4nH	FED FRY	70,000,000
AK14-51	2014	CHUM	ALASKA	SOUTHEAST	MEDVEJIE	DEEP INLET	4/29/2015	Thermal	DEEPINLETHF14	4n,3,2nH	FED FRY	11,183,247
AK14-52	2014	CHUM	ALASKA	SOUTHEAST	HIDDEN FALLS	KASNYKU BAY	5/18/2015	Thermal	HIDDENFALLS14	3,2n,2nH	FED FRY	23,868,519
AK14-53	2014	CHUM	ALASKA	SOUTHEAST	HIDDEN FALLS	KASNYKU BAY	5/29/2015	Thermal	HIDDENFALLS14LL	3,2n,4nH	FED FRY	6,513,515
AK14-54	2014	CHUM	ALASKA	SOUTHEAST	MEDVEJIE	BEAR COVE	4/14/2015	Thermal	BEARCOVE14	4,2,2H	FED FRY	14,752,476
AK14-55	2014	CHUM	ALASKA	SOUTHEAST	MEDVEJIE	BEAR COVE	4/30/2015	Thermal	BEARCOVE14LL	5n,4H	FED FRY	3,444,433
AK14-56	2014	CHUM	ALASKA	SOUTHCENTRAL	A F KOERNIG	SAWMILL BAY	5/27/2015	Thermal	WNH14B	1,2,3H	FED FRY	27,900,000
AK14-57	2014	CHUM	ALASKA	SOUTHEAST	MACAULAY	AMALGA HR, BOAT HR, GASTINEAU CH, LIMESTONE IN, THANE	5/28/2015	Thermal	DIPAC14	4H	FED FRY	107,448,600
AK14-59	2014	CHUM	ALASKA	SOUTHCENTRAL	WALLY NOERENBERG	LAKE BAY	5/17/2015	Thermal	WNH14C	1,3,3H	FED FRY	11,000,000
AK14-60	2014	CHUM	ALASKA	SOUTHEAST	HIDDEN FALLS	TAKATZ BAY	5/21/2015	Thermal	TAKATZ14	3,5,3H	FED FRY	31,396,973
AK14-61	2014	CHUM	ALASKA	SOUTHEAST	HIDDEN FALLS	TAKATZ BAY	5/28/2015	Thermal	TAKATZ14LL	3,5nH	FED FRY	11,826,533
AK14-62	2014	CHUM	ALASKA	SOUTHEAST	HIDDEN FALLS	SE COVE	5/30/2015	Thermal	SECOVE14LL	4,3,3H	FED FRY	17,478,583
AK14-63	2014	CHUM	ALASKA	SOUTHEAST	SAWMILL CREEK	CRAWFISH INLET	5/6/2015	Thermal	CRAWFISH14	3,6H	FED FRY	13,370,294
AK14-64	2014	CHUM	ALASKA	SOUTHEAST	WHITMAN LAKE	ANITA BAY, MCLEAN ARM	4/20/2015	Thermal	ANITABAY14	3,2,4H	FINGERLING	49,974,000
AK14-66	2014	CHUM	ALASKA	SOUTHEAST	NEETS BAY	NEETS BAY	4/16/2015	Thermal	NEETS BAY14SUM	4,4H4	FINGERLING	62,582,387
AK14-67	2014	CHUM	ALASKA	SOUTHEAST	NEETS BAY	NEETS BAY	4/30/2015	Thermal	NEETS BAY14FALL	4,2,2H4	FINGERLING	12,617,092
AK14-68	2014	CHUM	ALASKA	SOUTHEAST	WHITMAN LAKE	NAKAT INLET	4/14/2015	Thermal	NAKATINLET14SUM	3,2,3H	FINGERLING	8,380,000
AK14-69	2014	CHUM	ALASKA	SOUTHEAST	BURNETT INLET	ANITA BAY	5/5/2015	Thermal	ANITABAYLL14	4,1,2,1H	FINGERLING	1,913,000
AK14-70	2014	CHUM	ALASKA	SOUTHEAST	NEETS BAY	NAKAT INLET	5/2/2015	Thermal	NAKATINLET14FALL	3,4,1H4	FINGERLING	7,000,000

Continued

Table 1 (continued). Releases of otolith marked salmon from Alaska in 2015.

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	MARK ID	HATCH CODE	STAGE	NUMBER RELEASED
AK14-71	2014	CHUM	ALASKA	SOUTHEAST	NEETS BAY	BURNETT INLET	5/1/2015	Thermal	BURNETTINLET14FALL	4,5H6	FINGERLING	4,694,000
AK14-74	2014	CHUM	ALASKA	WESTWARD	KITOI BAY	KITOI BAY	5/8/2015	Thermal	KITOI14CHUM	3n,2H	FED FRY	15,882,618
AK14-75	2014	CHUM	ALASKA	WESTWARD	KITOI BAY	KITOI BAY	5/26/2015	Thermal	KITOI14CHUMA	3,4,2H	FED FRY	13,884,464
AK14-78	2014	COHO	ALASKA	SOUTHCENTRAL	TRAIL LAKES	BEAR LK	6/19/2015	Thermal	TRAILLAKES14SMCOHO	2,6H	FINGERLING	448,000
AK14-31	2014	PINK	ALASKA	SOUTHCENTRAL	A F KOERNIG	SAWMILL BAY	5/20/2015	Thermal	AFK14B	4H	FED FRY	137,800,000
AK14-32	2014	PINK	ALASKA	SOUTHCENTRAL	WALLY NOERENBERG	LAKE BAY	4/25/2015	Thermal	WNH14PINKB	8H	FED FRY	132,000,000
AK14-34	2014	PINK	ALASKA	SOUTHEAST	SHELDON JACKSON	CRESCENT BAY	4/28/2015	Thermal	SJ14PINK	4,1H	FED FRY	2,902,360
AK14-35	2014	PINK	ALASKA	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	5/6/2015	Thermal	PORTARMSTRONG14	3H	FED FRY	42,995,846
AK14-36	2014	PINK	ALASKA	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	4/21/2015	Thermal	PORTARMSTRONG14A	3H4	FED FRY	23,906,459
AK14-37	2014	PINK	ALASKA	SOUTHEAST	PORT ARMSTRONG	PORT ARMSTRONG	4/20/2015	Thermal	HERBERT14	3H3	FED FRY	20,762,573
AK14-38	2014	PINK	ALASKA	SOUTHCENTRAL	SOLOMON GULCH	SOLOMON GULCH	5/18/2015	Thermal	SGH14	6H	FED FRY	223,410,919
AK14-39	2014	PINK	ALASKA	SOUTHCENTRAL	CANNERY CREEK	CANNERY CR	5/20/2015	Thermal	CCH14	3,3H	FED FRY	172,000,000
AK14-41	2014	PINK	ALASKA	SOUTHCENTRAL	TUTKA BAY	TUTKA BAY	5/31/2015	Thermal	TUTKA14PINK	5,3H	FED FRY	11,249,240
AK14-43	2014	PINK	ALASKA	SOUTHCENTRAL	PORT GRAHAM	PAINT RIVER, PORT GRAHAM	6/10/2015	Thermal	PORTGRAHAM14	5H3	FED FRY	3,225,060
AK14-01	2014	SOCKEYE	ALASKA	SOUTHCENTRAL	GULKANA	CROSSWIND LK, PAXSON LK, SUMMIT LK	5/30/2015	Strontium	GULKANA14	HS1	FED FRY	21,987,000
AK14-02	2014	SOCKEYE	ALASKA	SOUTHCENTRAL	TRAIL LAKES	BEAR LK	6/4/2015	Thermal	TRAILLAKES14A	3,2H	FED FRY	2,415,000
AK14-08	2014	SOCKEYE	ALASKA	SOUTHCENTRAL	TRAIL LAKES	KIRSCHNER LK, LEISURE LK	6/12/2015	Thermal	PENINSULA14SOCKEYE	2,2H	FED FRY	1,288,000
AK14-09	2014	SOCKEYE	ALASKA	SOUTHCENTRAL	TRAIL LAKES	HAZEL LK	6/10/2015	Thermal	HAZEL14	3,3H3	FED FRY	621,000
AK14-10	2014	SOCKEYE	ALASKA	SOUTHCENTRAL	TRAIL LAKES	ENGLISH BAY L	10/22/2015	Thermal	ENGLISHBAY14	4H	PRESMOLT	200,200
AK14-102	2014	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TAHLTAN LK	5/20/2015	Thermal	TAHLTAN14B	3,2n,2H3	EMERGENT FRY	1,036,600
AK14-11	2014	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TATSAMENIE LK	5/22/2015	Thermal	TATSAMENIE14	3n,5H	EMERGENT FRY	730,600
AK14-16	2014	SOCKEYE	ALASKA	SOUTHCENTRAL	TRAIL LAKES	HIDDEN LK	5/1/2015	Thermal	HIDDENLAKE14	2,1,2H	UNFED FRY	1,497,000
AK14-20	2014	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TAHLTAN LK	5/23/2015	Thermal	TAHLTAN14	3,2n,2H	EMERGENT FRY	1,647,300
AK14-22	2014	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TATSAMENIE LK	5/30/2015	Thermal	TATSAMENIE14ER	6,2H	FED FRY	187,000
AK14-23	2014	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	SWEETHEART LK	5/24/2015	Thermal	SWEETHEART14	5,2H	EMERGENT FRY	516,400
AK14-26	2014	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-KING SALMON LK	5/23/2015	Thermal	KINGSALMON14	6,3H	EMERGENT FRY	169,400
AK14-27	2014	SOCKEYE	ALASKA	WESTWARD	PILLAR CREEK	JENNIFER LK, RUTH LK, SPIRIDON LK	6/17/2015	Dry	KODIAK14	3,3,3H	FED FRY	2,382,901
AK14-29	2014	SOCKEYE	ALASKA	WESTWARD	KITOI BAY	LITTLE KITOI LK	9/18/2015	Dry, Thermal	KITOI14	5,4H	PRESMOLT	69,293
AK15-102	2015	CHINOOK	ALASKA	WESTERN	NORTON SOUND	SOUTH R	9/29/2015	Thermal	SOUTH RIVER15	6,2H	ZYGOTE	93,320
AK15-76	2015	CHUM	ALASKA	WESTERN	NORTON SOUND	SNAKE R	10/6/2015	Thermal	NORTON15CHUM	1,2,2nH	ZYGOTE	140,000
AK15-89	2015	COHO	ALASKA	WESTERN	NORTON SOUND	SNAKE R	12/11/2015	Thermal	NORTON15COHO	2,3H	ZYGOTE	79,000