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Releases of Otolith Marked Salmon from Alaska in 2019

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 2019. It includes five species of salmon from brood years 2017 and 2018. Release numbers, mark patterns, and release locations are summarized.

Summary of Alaska Thermal Marking Programs

In Alaska, thermal marking of otoliths is mostly 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 2019, hatcheries in Alaska released the following numbers of otolith marked salmon: 5.2 million Chinook, 689 million chum, 8 million coho, 817 million pink, and 43 million sockeye. A list of otolith marks applied to hatchery-reared salmon released in 2019 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 2017 and 2018. In some instances, fish from the same thermal mark group are 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 2019.

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	MARK ID	HATCH CODE	STAGE	NUMBER RELEASED
AK17-104	2017	CHINOOK	AK	1	HIDDEN FALLS	GUNNUK CR, KASNYKU BAY	6/8/2019	Thermal	HIDDENFALLS17CHIN	4,2H	SMOLT	541,838
AK17-105	2017	CHINOOK	AK	1	CRYSTAL LAKE, PORT SAINT NICHOLAS, WHITMAN LAKE	CARROLL INLET, HERRING COVE, KETCHIKAN CR, NEETS BAY, PORT ST NICHOLAS	5/28/2019	Thermal	WHITMAN17CHIN	1,5H	SMOLT	1,808,170
AK17-106	2017	CHINOOK	AK	1	MEDVEIJE	BEAR COVE, CRAWFISH INLET, CRESCENT BAY	5/2/2019	Thermal	MEDVEIJE17CHIN	4,1H	SMOLT	1,897,715
AK17-110	2017	CHINOOK	AK	2	WALLY NOERENBERG	CHENEGA BAY	6/6/2019	Thermal	PWS17CHIN	2,4H	SMOLT	49,134
AK18-109	2018	CHINOOK	AK	1	MEDVEIJE	BEAR COVE, CRAWFISH INLET	6/3/2019	Thermal	MEDVEIJE18CHIN	2,3nH	SMOLT	897,822
AK18-49	2018	CHUM	AK	1	SHELDON JACKSON	CRESCENT BAY	4/30/2019	Thermal	SI18CHUM	4H	FED FRY	2,726,796
AK18-50	2018	CHUM	AK	1	PORT ARMSTRONG	PORT ARMSTRON	5/10/2019	Thermal	PORTARMSTRONG18CHUM	3H4	FED FRY	21,071,414
AK18-51	2018	CHUM	AK	1	PORT ARMSTRONG	PORT ARMSTRON	5/10/2019	Thermal	PORTARMSTRONG18CHUMLL	6H3	FED FRY	16,113,591
AK18-52	2018	CHUM	AK	1	MEDVEIJE, SAWMILL CREEK	BEAR COVE, DEEP INLET	5/12/2019	Thermal	DEEPINLETMV18	3,1,3H	FED FRY	29,459,746
AK18-54	2018	CHUM	AK	1	MEDVEIJE, SHELDON JACKSON	DEEP INLET	5/3/2019	Thermal	DEEPINLETMV18LL	3,2,5H	FED FRY	22,453,439
AK18-55	2018	CHUM	AK	2	WALLY NOERENBERG	LAKE BAY	5/27/2019	Thermal	WNH18A	3,4nH	FED FRY	68,500,000
AK18-56	2018	CHUM	AK	2	WALLY NOERENBERG	LAKE BAY	5/27/2019	Thermal	WNH18E	3,6nH	FED FRY	5,200,000
AK18-57	2018	CHUM	AK	1	HIDDEN FALLS	KASNYKU BAY	5/9/2019	Thermal	HIDDENFALLS18	3,5H	FED FRY	14,079,320
AK18-58	2018	CHUM	AK	1	HIDDEN FALLS	KASNYKU BAY	5/9/2019	Thermal	HIDDENFALLS18B	3,5-4H	FED FRY	18,013,326
AK18-59	2018	CHUM	AK	1	HIDDEN FALLS	KASNYKU BAY	5/27/2019	Thermal	HIDDENFALLS18LL	5n,4H	FED FRY	6,915,531
AK18-60	2018	CHUM	AK	1	HIDDEN FALLS	KASNYKU BAY	5/24/2019	Thermal	HIDDENFALLS18LLB	5n,4-4H	FED FRY	8,615,567
AK18-61	2018	CHUM	AK	1	MEDVEIJE	BEAR COVE	4/28/2019	Thermal	BEARCOVE18LL	4,2,1H	FED FRY	14,528,591
AK18-62	2018	CHUM	AK	2	A F KOERNIG	SAWMILL BAY	5/28/2019	Thermal	WNH18B	1,2,3H	FED FRY	18,500,000
AK18-63	2018	CHUM	AK	1	MACAULAY	AMALGA HARBOR, BOAT HARBOR, GASTINEAU CH, LIMESTONE IN, THANE NET PENS	6/3/2019	Thermal	DIPAC18	1,3H	FED FRY	103,136,100
AK18-65	2018	CHUM	AK	2	WALLY NOERENBERG	PORT CHALMERS	5/21/2019	Thermal	WNH18C	1,3,3H	FED FRY	20,500,000
AK18-66	2018	CHUM	AK	2	WALLY NOERENBERG	LAKE BAY	5/27/2019	Thermal	WNH18D	4,3,3H	FED FRY	8,700,000
AK18-67	2018	CHUM	AK	1	HIDDEN FALLS	SE COVE	5/25/2019	Thermal	SECOVE18	8,2H	FED FRY	17,074,771
AK18-68	2018	CHUM	AK	1	HIDDEN FALLS	SE COVE	5/30/2019	Thermal	SECOVE18LL	8H	FED FRY	19,569,520
AK18-69	2018	CHUM	AK	1	HIDDEN FALLS	THOMAS BAY	5/11/2019	Thermal	THOMASBAY18	5n,2H	FED FRY	6,881,163
AK18-70	2018	CHUM	AK	1	HIDDEN FALLS	THOMAS BAY	5/29/2019	Thermal	THOMASBAY18LL	3,3,2H	FED FRY	8,469,381
AK18-71	2018	CHUM	AK	1	HIDDEN FALLS	GUNNUK CR	5/25/2019	Thermal	GUNNUKCREEK18	7,4H	FED FRY	7,071,823
AK18-72	2018	CHUM	AK	1	HIDDEN FALLS	GUNNUK CR	5/30/2019	Thermal	GUNNUKCREEK18LL	3,3H3	FED FRY	8,785,255
AK18-74	2018	CHUM	AK	1	SAWMILL CREEK	CRAWFISH INLET	5/17/2019	Thermal	CRAWFISH18LL	4,6H	FED FRY	15,205,614
AK18-75	2018	CHUM	AK	1	BURNETT INLET	ANITA BAY	4/26/2019	Thermal	ANITABAY18	1,6H	FINGERLING	17,439,000
AK18-76	2018	CHUM	AK	1	WHITMAN LAKE	KENDRICK BAY	5/1/2019	Thermal	KENDRICK18	5,3H	FINGERLING	25,936,396
AK18-77	2018	CHUM	AK	1	WHITMAN LAKE	KENDRICK BAY	5/11/2019	Thermal	KENDRICK18LL	5,3,3H	FINGERLING	4,186,728
AK18-78	2018	CHUM	AK	1	NEETS BAY	NEETS BAY	4/28/2019	Thermal	NEETS BAY18SUM	4,4H	FINGERLING	62,374,123

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Table 1 (continued). Releases of otolith marked salmon from Alaska in 2019.

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AK18-79	2018	CHUM	AK	1	BURNETT INLET	BURNETT INLET	4/24/2019	Thermal	BURNETTINLET18	3,5,3H	FINGERLING	23,007,325
AK18-80	2018	CHUM	AK	1	NEETS BAY	NEETS BAY	5/16/2019	Thermal	NEETSBAY18FALL	4,2,2H	FINGERLING	16,869,505
AK18-81	2018	CHUM	AK	1	BURNETT INLET, WHITMAN LAKE	NAKAT INLET	5/12/2019	Thermal	NAKATINLET18SUM	3,1,4H	FINGERLING	13,275,215
AK18-82	2018	CHUM	AK	1	BURNETT INLET	ANITA BAY	5/5/2019	Thermal	ANITABAYLL18	4n,4H	FINGERLING	5,748,000
AK18-83	2018	CHUM	AK	1	NEETS BAY	NAKAT INLET	5/12/2019	Thermal	NAKATINLET18FALL	3,4,1H	FINGERLING	4,103,975
AK18-84	2018	CHUM	AK	1	BURNETT INLET	BURNETT INLET	5/24/2019	Thermal	BURNETTINLET18FALL	5H5	FINGERLING	2,753,375
AK18-85	2018	CHUM	AK	1	BURNETT INLET	PORT ASUMCION	5/4/2019	Thermal	PORTASUMCION18	7n,3H	FINGERLING	17,893,317
AK18-88	2018	CHUM	AK	4	KITOI BAY	KITOI BAY	5/20/2019	Thermal	KITOI18CHUM	3,3,3H	FED FRY	14,900,000
AK18-89	2018	CHUM	AK	4	KITOI BAY	KITOI BAY	5/6/2019	Thermal	KITOI18CHUMA	3,2,4H	FED FRY	14,900,000
AK18-90	2018	CHUM	AK	1	TAMGAS CREEK	TAMGAS CR	4/28/2019	Thermal	TAMGAS18	4H3	FED FRY	4,441,398
AK17-89	2017	COHO	AK	2	WALLY NOERENBERG	CHENEGA BAY, FLEMING SPIT, LAKE BAY, WHITTIER HBR	6/7/2019	Thermal	WNH17COHO	3H	SMOLT	1,886,822
AK17-90	2017	COHO	AK	2	TRAIL LAKES	BEAR CR	5/24/2019	Thermal	TRAILLAKES17SMCOHO	2,6H	SMOLT	61,000
AK17-93	2017	COHO	AK	2	SOLOMON GULCH	BOULDER BAY, SOLOMON GULCH	6/12/2019	Dry	SGH17COHO	6H	SMOLT	1,808,253
AK17-95	2017	COHO	AK	1	SAWMILL CREEK	BEAR COVE	5/9/2019	Thermal	MEDVEJIE17COHO	4,2,2H	SMOLT	204,243
AK17-96	2017	COHO	AK	1	SAWMILL CREEK	DEEP INLET	5/10/2019	Thermal	DEEPINLET17COHO	4H	SMOLT	1,828,650
AK17-97	2017	COHO	AK	1	KLAWOCK RIVER	PORT ASUMCION	5/23/2019	Thermal	KLAWOCK17COHO	4,2H	SMOLT	318,756
AK17-99	2017	COHO	AK	1	WHITMAN LAKE	NAKAT INLET	5/21/2019	Thermal	NAKAT17COHO	2,5H	SMOLT	594,248
AK17-100	2017	COHO	AK	4	PILLAR CREEK	ISLAND LK, MISSION LK, MONASHKA CR, PILLAR CR	4/18/2019	Thermal	PILLAR17COHO	5H	SMOLT	207,505
AK17-102	2017	COHO	AK	1	SHELDON JACKSON	CRESCENT BAY	5/15/2019	Thermal	SJ17COHO	6,3H	SMOLT	65,507
AK18-91	2018	COHO	AK	1	MACAULAY	DAVIDSON CR	6/13/2019	Thermal	DAVIDSON18	6,2H	FED FRY	95,800
AK18-94	2018	COHO	AK	2	TRAIL LAKES	BEAR LK	6/10/2019	Thermal	BEARLAKE18COHO	5,3H	FED FRY	453,000
AK18-104	2018	COHO	AK	4	KITOI BAY	CRESCENT LK, JENNIFER LK, KATMAI LK, RUTH LK	6/27/2019	Dry	KITOI18BAY18	3,4H	FED FRY	251,100
AK18-104	2018	COHO	AK	4	KITOI BAY	CRESCENT LK, JENNIFER LK, KATMAI LK, RUTH LK	8/19/2019	Dry	KITOI18BAY18	3,4H	FINGERLING	223,200
AK18-31	2018	PINK	AK	2	A F KOERNIG	SAWMILL BAY	5/14/2019	Thermal	AFK18B	4H	FED FRY	157,000,000
AK18-32	2018	PINK	AK	2	WALLY NOERENBERG	LAKE BAY	5/22/2019	Thermal	WNH18PINKB	8H	FED FRY	135,600,000
AK18-33	2018	PINK	AK	1	SHELDON JACKSON	CRESCENT BAY	4/30/2019	Thermal	SJ18PINK	4,1H	FED FRY	2,724,678
AK18-34	2018	PINK	AK	1	PORT ARMSTRONG	PORT ARMSTRON	5/5/2019	Thermal	PORTARMSTRONG18	3H	FED FRY	26,195,497
AK18-36	2018	PINK	AK	1	PORT ARMSTRONG	PORT ARMSTRON	5/5/2019	Thermal	PORTARMSTRONG18B	3H3	FED FRY	10,591,576
AK18-39	2018	PINK	AK	2	SOLOMON GULCH	SOLOMON GULCH	5/18/2019	Thermal	SGH18	6H	FED FRY	256,977,826
AK18-40	2018	PINK	AK	2	CANNERY CREEK	CANNERY CR	5/28/2019	Thermal	CCH18	3,3H	FED FRY	102,900,000
AK18-42	2018	PINK	AK	2	TUTKA BAY	TUTKA BAY	5/29/2019	Thermal	TUTKA18PINK	5,3H3	FED FRY	42,204,841
AK18-43	2018	PINK	AK	2	TUTKA BAY	TUTKA BAY	5/29/2019	Thermal	TUTKA18PINKA	4,4H3	FED FRY	10,881,924

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AK18-44	2018	PINK	AK	2	TUTKA BAY	TUTKA BAY	5/29/2019	Thermal	TUTKA18PINKB	4,3H	FED FRY	22,603,524
AK18-45	2018	PINK	AK	2	TUTKA BAY	TUTKA BAY	5/9/2019	Thermal	TUTKA18PINKC	5H	FED FRY	9,890,249
AK18-46	2018	PINK	AK	2	PORT GRAHAM	PORT GRAHAM	5/31/2019	Thermal	PORTGRAHAM18	5H3	FED FRY	10,144,850
AK18-48	2018	PINK	AK	4	KITOI BAY	KITOI BAY	5/13/2019	Dry	KITOI18PINK	7H	FED FRY	29,049,062
AK17-03	2017	SOCKEYE	AK	2	MAIN BAY	MAIN BAY	5/23/2019	Thermal	MBH17A	5H3	SMOLT	2,210,000
AK17-04	2017	SOCKEYE	AK	2	MAIN BAY	MAIN BAY	5/23/2019	Thermal	MBH17B	5H2,2	SMOLT	2,180,000
AK17-05	2017	SOCKEYE	AK	2	MAIN BAY	MAIN BAY	5/25/2019	Thermal	MBH17C	5H5	SMOLT	2,132,000
AK17-06	2017	SOCKEYE	AK	2	MAIN BAY	MAIN BAY	5/25/2019	Thermal	MBH17D	5H3,3	SMOLT	2,162,000
AK17-07	2017	SOCKEYE	AK	2	MAIN BAY	MAIN BAY	5/23/2019	Thermal	MBH17E	5H	SMOLT	2,210,000
AK17-13	2017	SOCKEYE	AK	2	TRAIL LAKES	RESURRECTION BAY	5/26/2019	Thermal	TRAILLAKES17B	1,3H	SMOLT	1,510,000
AK17-16	2017	SOCKEYE	AK	2	TRAIL LAKES	SHELL LK	5/22/2019	Thermal	SHELLLAKE17	4,4,2H	SMOLT	15,230
AK17-17	2017	SOCKEYE	AK	1	SNETTISHAM	SPEEL ARM	5/30/2019	Thermal	SPEELARM17B	3n,4,3H	SMOLT	644,200
AK17-19	2017	SOCKEYE	AK	2	TRAIL LAKES	TUTKA BAY	5/23/2019	Thermal	TUTKA17	4,2H	SMOLT	427,000
AK17-25	2017	SOCKEYE	AK	4	PILLAR CREEK	TELROD COVE	5/23/2019	Dry	KODIAK17A	4,4H	SMOLT	546,032
AK17-26	2017	SOCKEYE	AK	4	KITOI BAY	LITTLE KITOI LK, OUZINKIE BOAT HARBOR 259	6/3/2019	Dry	KITOI17	5,4H	SMOLT	667,629
AK18-01	2018	SOCKEYE	AK	2	GULKANA	CROSSWIND LK, PAXSON LK	5/28/2019	Strontium	GULKANA18	HS1	FED FRY	14,485,129
AK18-02	2018	SOCKEYE	AK	2	TRAIL LAKES	BEAR LK	6/7/2019	Thermal	TRAILLAKES18A	4,2H	FED FRY	2,427,000
AK18-08	2018	SOCKEYE	AK	2	TRAIL LAKES	LEISURE LK	7/2/2019	Thermal	LEISURE18	H2,2	FED FRY	1,085,000
AK18-09	2018	SOCKEYE	AK	2	TRAIL LAKES	KIRSCHNER LK	6/27/2019	Thermal	KIRSCHNER18	4H2,2	FED FRY	258,000
AK18-10	2018	SOCKEYE	AK	2	TRAIL LAKES	HAZEL LK	6/28/2019	Thermal	HAZEL18	H2,2,2	FED FRY	1,293,000
AK18-11	2018	SOCKEYE	AK	1	SNETTISHAM	R-TATSAMENIE LK	5/19/2019	Thermal	TATSAMENIE18	3n,2H	EMERGENT FRY	1,390,000
AK18-16	2018	SOCKEYE	AK	2	TRAIL LAKES	HIDDEN LK	4/25/2019	Thermal	HIDDENLAKE18	3,2,1H	EMERGENT FRY	1,094,000
AK18-19	2018	SOCKEYE	BC	1	SNETTISHAM	R-TAHLTAN LK	5/18/2019	Thermal	TAHLTAN18	1,4H	EMERGENT FRY	1,858,000
AK18-21	2018	SOCKEYE	AK	1	SNETTISHAM	R-TATSAMENIE LK	5/25/2019	Thermal	TATSAMENIE18ER	4,4H	FED FRY	192,500
AK18-22	2018	SOCKEYE	AK	1	SNETTISHAM	R-TATSAMENIE LK	6/14/2019	Thermal	TATSAMENIE18ERB	8H	FED FRY	178,400
AK18-23	2018	SOCKEYE	AK	1	SNETTISHAM	SWEETHEART LK	5/17/2019	Thermal	SWEETHEART18	2,5H	EMERGENT FRY	469,200
AK18-26	2018	SOCKEYE	AK	4	PILLAR CREEK	JENNIFER LK, RUTH LK, SPIRIDON LK	43624	Dry	KODIAK18	6H	FED FRY	3205446