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## **Releases of Otolith Marked Salmon from Canada in 2019**

by

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## **Abstract**

Thermal mass marking of salmon has, for a number of years, played an important role in stock, hatchery, and both fisheries and research management within Canada. This document follows up on previous documents outlining Canada's thermal marking proposals including those for brood year 2018 (Till 2019). It summarizes all thermally marked salmonids released from BC hatcheries in 2019 by species, hatch mark, facility, release location and release number.

## **Summary of Canadian Thermal Marking Programs**

Thermal marking in British Columbia is one tool that is helping to answer a number of questions regarding the spatial and temporal migration and distribution of hatchery raised salmonids and infer information about some natural (wild) populations.

Thermal marks are being used to assess hatchery contributions to escapement, to infer the success and contribution of natural (wild) spawners, and to assess hatchery straying. On the West Coast of Vancouver Island (WCVI) thermal marks are also being used along with CWT's and DNA to reconstruct Chinook terminal returns. Results such as migration timing and distribution patterns of different stocks will inform fishery management, improve the forecasting of terminal returns and allow comparisons of different release strategies over time, including timing and location of releases, fast or slow growth strategies and naturalized rearing habitats.

Results from the thermal marking are also being compared with those using CWT to assess the relative biases in CWT.

Canadian facilities released a total of 44.0 million thermally marked salmon in 2019. The vast majority of these releases were sub yearlings from the 2018 brood year, with just 30 thousand being yearling coho from the 2017 brood year. A total of 15.0 million Chinook were released with 28 different thermal marks at 24 different locations. 8 different marks were applied to 24.5 million chum and released at ten locations. Five different sockeye marks were applied in the Okanagan and Pitt River to a total of 4.6 million fish. Limited numbers of coho were also released in 2019 and no pink.

A further 4.3 million sockeye were marked in Alaskan facilities but released into Canadian waters. These consisted of five different marks raised at Snettisham hatchery and released to 3 Transboundary systems.

All release details have been entered into the NPAFC thermal marking database and are listed in Table 1 using 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. 39 pp. (Available at <https://npafc.org>).
- Till, J. 2019. Releases of otolith marked salmon from Canada in 2018. NPAFC Doc. 1843. 4 pp. Fisheries and Oceans Canada, South Coast Stock Assessment (Available at <https://npafc.org>).

**Table 1.** Releases of otolith marked salmon from Canada in 2019.

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	LOCAL MARK NAME	HATCH CODE	STAGE	NUMBER RELEASED
CA18-40	2018	CHINOOK	BRITISH COLUMBIA	LWFR	H-CHILLIWACK RIVER H	R-CHILLIWACK R, R-IOCO, R-REED POINT	6-Jun-19	Thermal	CHRH2018CHINOOKH7	H7	SMOLT	1,368,891
CA18-19	2018	CHINOOK	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-BURMAN EST	30-Apr-19	Thermal	CORH2018CHINOOKH42	H4,2	SMOLT	78,396
CA18-17	2018	CHINOOK	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-CONUMA EST	27-Apr-19	Thermal	CORH2018CHINOOKH52	H5-2	SMOLT	1,383,965
CA18-18	2018	CHINOOK	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-CONUMA EST	15-May-19	Thermal	CORH2018CHINOOKH53	H5-3	SMOLT	1,281,041
CA18-16	2018	CHINOOK	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-CONUMA R	8-May-19	Thermal	CORH2018CHINOOKH54	H5-4	SMOLT	438,611
CA18-20	2018	CHINOOK	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-TAHSIS IN	15-Jun-19	Thermal	CONH2018CHINOOKH9	H9	SMOLT	162,626
CA18-45	2018	CHINOOK	BRITISH COLUMBIA	GSVI	H-COWICHAN RIVER H	R-COWICHAN R	30-May-19	Thermal	COWH2018CHINOOK41H	4-1H	SMOLT	614,248
CA18-41	2018	CHINOOK	BRITISH COLUMBIA	JNST	H-GWANI H	R-NIMPKISH R LOW	10-Jun-19	Thermal	GWAH2018CHINOOK33NH	3,3nH	SMOLT	7,021
CA18-39	2018	CHINOOK	BRITISH COLUMBIA	GSVI	H-NANAIMO RIVER H	R-FIRST LK/GSVI	14-May-19	Thermal	NANH2018CHINOOKH5	H5	SMOLT	183,928
CA18-38	2018	CHINOOK	BRITISH COLUMBIA	GSVI	H-NANAIMO RIVER H	R-NANAIMO R	15-May-19	Thermal	NANH2018CHINOOKH23	H2-3	SMOLT	406,052
CA18-07	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-NITINAT LK	21-May-19	Thermal	NITH2018CNH232	H2,3,2	SMOLT	930,994
CA18-05	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-NITINAT LK	21-May-19	Thermal	NITH2018CHINOOKH2322	H2,3,2,2	FED FRY	966,118
CA18-03	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-NITINAT LK	21-May-19	Thermal	NITH2018CHINOOKH2323	H2,3,2,3	FED FRY	974,345
CA18-04	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-NITINAT LK	21-May-19	Thermal	NITH2018CHINOOKH3232	H3,2,3,2	SMOLT	940,180
CA18-02	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-SARITA R	28-May-19	Thermal	NITH2018CHINOOKH314	H3,1,4	FED FRY	162,122
CA18-01	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-SARITA R	28-May-19	Thermal	NITH2018CHINOOKH323	H3,2,3	SMOLT	142,043
CA18-06	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-SOOKE HB	20-May-19	Thermal	NITH2018CHINOOK14H	1,4H	SMOLT	607,995
CA18-48	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-SOOKE R	18-May-19	Thermal	NITH2018CHINOOK4H	4H	FED FRY	248,178
CA18-26	2018	CHINOOK	BRITISH COLUMBIA	JNST	H-QUINSAM RIVER H	R-DISCOVERY PASS	1-May-19	Thermal	QUNH2018CHINOOKH22	H2/2	SMOLT	561,615
CA18-29	2018	CHINOOK	BRITISH COLUMBIA	JNST	H-QUINSAM RIVER H	R-ELK FALLS CH #1, R-ELK FALLS CH #2, R-ELK FALLS CH #3	22-Mar-19	Thermal	QUNH2018CHINOOKH34	3-4H	UNFED FRY	896,287
CA18-27	2018	CHINOOK	BRITISH COLUMBIA	JNST	H-QUINSAM RIVER H	R-QUINSAM R	13-Jun-19	Thermal	QUNH2018CHINOOKH222	H2/2/2	SMOLT	1,873,998
CA18-28	2018	CHINOOK	BRITISH COLUMBIA	JNST	H-QUINSAM RIVER H	R-QUINSAM R	10-May-19	Thermal	QUNH2018CHINOOKH224	H2/2/4	SMOLT	207,777
CA18-35	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-ROBERTSON CREEK H	R-ALBERNI IN	4-Jun-19	Thermal	ROBH2018CHINOOKH5	H5	SMOLT	169,637
CA18-34	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-ROBERTSON CREEK H	R-ROBERTSON CR	6-May-19	Thermal	ROBH2018CHINOOKH32	H3/2	SMOLT	82,357
CA18-12	2018	CHINOOK	BRITISH COLUMBIA	SWVI	H-SAN JUAN RIVER H	R-FAIRY LK	6-Jun-19	Thermal	SJUH2018CHINOOKH3	H3	SMOLT	66,794
CA18-44	2018	CHINOOK	BRITISH COLUMBIA	TOMF	H-SPIUS CREEK H	R-COLDWATER R		Thermal	SPIU2018CHINOOKH332	H3/5	FED FRY	17,292
CA18-43	2018	CHINOOK	BRITISH COLUMBIA	TOMF	H-SPIUS CREEK H	R-SALMON R/TOMF		Thermal	SPIU2018CNH442	H3/4,2	FED FRY	63,297
CA18-25	2018	CHINOOK	BRITISH COLUMBIA	NWVI	H-TAHSIS RIVER H	R-TAHSIS IN	15-Jun-19	Thermal	TAH2018CHINOOKH73	H7,3	SMOLT	156,446

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

NPAFC ID	BROOD YEAR	SPECIES	STATE	REGION	FACILITY	RELEASE SITE	DATE RELEASED	MARK TYPE	LOCAL MARK NAME	HATCH CODE	STAGE	NUMBER RELEASED
CA18-21	2018	CHUM	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-CANTON CR	16-Apr-19	Thermal	CORH2018CHUMH22	H2,2	FED FRY	511,748
CA18-23	2018	CHUM	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-CONUMA EST	18-Apr-19	Thermal	CORH2018CHUMH5	H5	FED FRY	1,679,255
CA18-22	2018	CHUM	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-CONUMA R	15-Apr-19	Thermal	CORH2018CHUMH7	H7	FED FRY	563,431
CA18-24	2018	CHUM	BRITISH COLUMBIA	NWVI	H-CONUMA RIVER H	R-SUCWOA R, R-TLUPANA R	17-Apr-19	Thermal	CORH2018CHUMH23	H2,3	FED FRY	1,730,692
CA18-14	2018	CHUM	BRITISH COLUMBIA	JNST	H-GWANI H	R-ALERT BAY	13-Jun-19	Thermal	GWAH2018CHUMH42	H4,2	FED FRY	970,995
CA18-15	2018	CHUM	BRITISH COLUMBIA	JNST	H-GWANI H	R-NIMPKISH R LOW	18-Apr-19	Thermal	GWAH2018CHUMH42	H4-2	FED FRY	852,252
CA18-13	2018	CHUM	BRITISH COLUMBIA	NCST	H-KITIMAT RIVER H	R-KITIMAT R	4-Aug-19	Thermal	KITH2018CHUMH14	H1,3	FED FRY	1,635,975
CA18-11	2018	CHUM	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-NITINAT LK, R-NITINAT R	30-Apr-19	Thermal	NITH2018CHUM31H	3,1H	FED FRY	16,512,986
CA17-01	2017	COHO	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-NITINAT R	4-May-19	Thermal	NITH2017COH23	H2,3	YEARLING	11,216
CA17-02	2017	COHO	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-NITINAT R	4-May-19	Thermal	NITH2017COH3	H3	YEARLING	7,307
CA17-04	2017	COHO	BRITISH COLUMBIA	SWVI	H-NITINAT RIVER H	R-NITINAT R	4-May-19	Thermal	NITH2017COH4	H4	YEARLING	11,569
CA18-37	2018	SOCKEYE	BRITISH COLUMBIA	LWFR	H-INCH CREEK H	R-A PATTERSON CH	15-May-19	Thermal	INCH2018SOCKEYEH42	H4,2	FED FRY	505,530
CA18-33	2018	SOCKEYE	BRITISH COLUMBIA	TOMF	H-KL CP' ELK' STIM' H	R-MISSION CR/OKAN, R-POWERS CR, R-SIX MILE CR	30-Apr-19	Thermal	KLCH2018SOCKEYEH343	H3,4,3	FED FRY	484,827
CA18-32	2018	SOCKEYE	BRITISH COLUMBIA	TOMF	H-KL CP' ELK' STIM' H	R-POWERS CR	17-Apr-19	Thermal	KLCH2018SOCKEYEH342	H3,4,2	FED FRY	1,176,733
CA18-31	2018	SOCKEYE	BRITISH COLUMBIA	TOMF	H-KL CP' ELK' STIM' H	R-SIX MILE CR	26-Apr-19	Thermal	KLCH2018SOCKEYEH341	H3,4,1	FED FRY	982,101
CA18-30	2018	SOCKEYE	BRITISH COLUMBIA	TOMF	H-KL CP' ELK' STIM' H	R-TROUT CR/OKAN	12-Apr-19	Thermal	KLCH2018SOCKEYEH34	H3,4	FED FRY	1,409,652
AK18-19	2018	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TAHLTAN LK		Thermal	TAHLTAN18	1,4H	EMERGENT FRY	2,000,000
AK18-11	2018	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TATSAMENIE LK	19-May-19	Thermal	TATSAMENIE18	3n,2H	EMERGENT FRY	1,390,000
AK18-21	2018	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TATSAMENIE LK		Thermal	TATSAMENIE18ER	4,4H	FINGERLING	200,000
AK18-22	2018	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TATSAMENIE LK		Thermal	TATSAMENIE18ERB	8H	FINGERLING	
AK18-12	2018	SOCKEYE	ALASKA	SOUTHEAST	SNETTISHAM	R-TRAPPER LK		Thermal	TRAPPER18	2,4H	EMERGENT FRY	700,000