

**Proposed Thermal Marks for Salmon from Canada,
Brood Year 2019**

by

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Proposed Thermal Marks for Salmon from Canada, Brood Year 2019

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Abstract

Thermal marking continues to play an important role for both stock, hatchery, and fisheries management and research in Canada. Canada plans to thermally mark approximately 74 million Pacific salmon from the 2019 brood year for release in 2020/21. Thermal marking will include 59 different thermal marks applied at 17 hatcheries with marked salmon released at over 50 locations. The plan is similar to the 2018 brood year marking plan, fish planned for release in 2019/20 (Till 2018).

Introduction

Thermal marking in Canada continues to focus primarily on Chinook and chum stocks with increasing numbers of sockeye and limited marking of coho and pink. Thermal marks are used to distinguish hatchery from naturally spawned (wild) salmon in terminal fisheries and in spawning populations. Thermal marks on sockeye, Chinook, coho and pink are also being used to assess different hatchery release strategies. For chum salmon the use of thermal marks has replaced finclips as a means for marking fish at some hatcheries. Thermal marks are also being used to validate information on the harvest, survival and straying rates of Chinook salmon estimated by coded-wire tag studies (Hankin et al. 2005).

Plan for 2019 Brood Year Stocks

The proposed thermal marking program for salmon in Canada for the 2019 brood year is shown in Table 1; using the Uniform Hatch Code notation (Johnson et al. 2006). However, due to practical application considerations the delimiters being used remain those described in Thermal Marking Of Otoliths. The "RBr" Coding Structure Of Thermal Marks (Munk and Geiger, 1998). The bulk of the proposal is similar to that submitted for the marking of salmon in Canadian hatcheries for brood year 2018 (Till 2018). Proposed marks remain the same except where prevented by operational constraints or where conflicts arose with marking proposals from other NPAFC members. One additional change of note is Nitinat hatchery chum release where we propose a slight change of our mark from 3,1H to 3-2H to ensure easier and more accurate identification of that mark. Important components of the plan include continuation of Chinook marking at both Cowichan and Nanaimo River Hatcheries on the East Coast of Vancouver Island (ECVI) to permit assessment of hatchery contribution to these depressed ECVI stocks. Additionally, the use of multiple thermal marks at Nitinat River Hatchery for both Chinook and coho is permitting continued assessment of traditional and enhanced (nautiralization of rearing channels and ponds), rearing strategies and different release locations for these species. Additional pink marking is being planned for Quinsam hatchery where a new chiller system is expected to be on line for the 2019 season.

References

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Table 1. Proposed Canadian releases of thermal marked salmon from 2019 brood year.

Brood Year	Species	Facility	Hatch Code	Proposed Release (Thousand's)	Release Site/Description
2019	Chinook	Chilliwack River Hatchery	H7	1,900	Chilliwack River + Various Misc
2019	Chinook	Conuma River Hatchery	H2,4	350	Muchalat Lake Pen
2019	Chinook	Conuma River Hatchery	H2,5	150	Gold River Estuary Sea pen
2019	Chinook	Conuma River Hatchery	H4,2	350	Burman Estuary
2019	Chinook	Conuma River Hatchery	H5-2	1,350	Conuma Estuary. Early sea pen release
2019	Chinook	Conuma River Hatchery	H5-3	1,350	Conuma Estuary. Late sea pen release
2019	Chinook	Conuma River Hatchery	H5-4	500	Conuma River
2019	Chinook	Conuma River Hatchery	H9	160	Tahsis River
2019	Chinook	Cowichan River Hatchery	4-1H	700	Cowichan River
2019	Chinook	Gwa'ni Hatchery	3,3nH	300	Nimpkish River
2019	Chinook	Marble River Hatchery	3,2,2H	900	Marble River
2019	Chinook	Marble River Hatchery	3,2,3H	90	Quatsino Sound
2019	Chinook	Nanaimo River Hatchery	H2-3	400	Nanaimo River (fall run)
2019	Chinook	Nanaimo River Hatchery	H5	220	Nanaimo River (summer run)
2019	Chinook	Nitinat River Hatchery	H2,3,2	1,000	Nitinat River Traditional Large
2019	Chinook	Nitinat River Hatchery	H2,3,2,2	1,000	Nitinat River Traditional Small
2019	Chinook	Nitinat River Hatchery	H2,3,2,3	1,000	Nitinat Enriched Small
2019	Chinook	Nitinat River Hatchery	H3,2,3,2	1,000	Nitinat Enriched Large
2019	Chinook	Nitinat River Hatchery	H3,2,3	0 (2 year rotation)	Sarita River Traditional Large
2019	Chinook	Nitinat River Hatchery	H3,2,4	250	Sarita River Traditional Large
2019	Chinook	Nitinat River Hatchery	H3,1,3	250	Sarita River Enriched Small
2019	Chinook	Nitinat River Hatchery	H3,1,4	0 (2 year rotation)	Sarita River Enriched Small
2019	Chinook	Nitinat River Hatchery. Transferred to Jack Brooks Hatchery	4H	250	Sooke River (egg transfers)
2019	Chinook	Nitinat River Hatchery	1,4H	500	Sooke Seapens (fry outplants)
2019	Chinook	Nitinat River Hatchery	1,4H	100	Sooke Harbour Seapen (smolts)
2019	Chinook	Puntledge River Hatchery	H6	1,450	Puntledge River
2019	Chinook	Quinsam River Hatchery	H2/2/2	1,900	Quinsam River
2019	Chinook	Quinsam River Hatchery	H2/2	650	Quinsam River Sea pens
2019	Chinook	Quinsam River Hatchery	H2/2/4	250	Lower Quinsam Lake outplants. Late fed fry.
2019	Chinook	Quinsam River Hatchery	2-4H	150	Upper Quinsam River. Eyed egg plant
2019	Chinook	Quinsam River Hatchery	3-4H	960	Campbell River. Unfed fry
2019	Chinook	Quinsam River Hatchery	H2/2/2/2	120	Salmon River
2019	Chinook	Robertson Creek Hatchery	3H	5,800	Stamp River
2019	Chinook	Robertson Creek Hatchery	3H4	200	Underwood Cove seapen.
2019	Chinook	Robertson Creek Hatchery	3H3/2	100	Stamp River accelerated
2019	Chinook	Robertson Creek Hatchery	H3/2	0	Nahmint River
2019	Chinook	San Juan Enhancement Soc.	H4	720	San Juan River
2019	Chinook	Spilus Creek Hatchery	H3/3,2	55	Coldwater River (yearling)
2019	Chinook	Spilus Creek Hatchery	H3/3,2	30	Coldwater River (fed fry)
2019	Chinook	Spilus Creek Hatchery	H3/3	65	Spilus Creek (fed fry)
2019	Chinook	Spilus Creek Hatchery	H4/4,2	70	Salmon River (fed fry)
2019	Chinook	Tahsis River Hatchery	H7,3	160	Leiner River

Table 1. Proposed Canadian releases of thermal marked salmon from 2019 brood year. (cont'd)

Brood Year	Species	Facility	Hatch Code	Proposed Release (Thousand's)	Release Site/Description
2019	Chum	Conuma River Hatchery	H2,2	500	Canton River
2019	Chum	Conuma River Hatchery	H2,3	500	Sucwoa River
2019	Chum	Conuma River Hatchery	H2,3	1,000	Tlupana River
2019	Chum	Conuma River Hatchery	H5	1,500	Conuma Estuary Sea pen
2019	Chum	Conuma River Hatchery	H7	500	Conuma Side Channel
2019	Chum	Gwa'ni Hatchery	H3,2	150	Nimpkish River
2019	Chum	Gwa'ni Hatchery	H4,2	1,000	Nimpkish River Release - Puntledge stock
2019	Chum	Gwa'ni Hatchery	H4-2	1,000	Nimpkish Seapen Release - Puntledge stock
2019	Chum	Kitimat River Hatchery	H1,4	1,700	Kitimat River
2019	Chum	McIntyre Creek	6,5H	20	Porcupine River/ Fishing Branch River
2019	Chum	McIntyre Creek	6-3H	20	Porcupine River/ Fishing Branch River
2019	Chum	Nitinat River Hatchery	3-2H	30,000	Nitinat River/Lake
2019	Coho	Nitinat River Hatchery	H2,3	50	Nitinat Enriched Large Smolts (yearling)
2019	Coho	Nitinat River Hatchery	H2,4	0	Nitinat BKD Unscreened Smolts (yearling)
2019	Coho	Nitinat River Hatchery	H3	50	Nitinat Traditional Large Smolts (yearling)
2019	Coho	Nitinat River Hatchery	H4	50	Nitinat Enriched Small Smolts (yearling)
2019	Sockeye	Inch Creek Hatchery	H4,2	500	Pitt River
2019	Sockeye	Kl cp'elk'stim Hatchery	H3,3	1,250	Shingle Creek
2019	Sockeye	Kl cp'elk'stim Hatchery	H3,3,1	1,250	Shingle Creek
2019	Sockeye	Kl cp'elk'stim Hatchery	H3,3,2	1,250	Shingle Creek
2019	Sockeye	Kl cp'elk'stim Hatchery	H3,3,3	1,250	Shingle Creek
2019	Sockeye	Kl cp'elk'stim Hatchery	H3,4	0 (2 year rotation)	Shingle Creek
2019	Sockeye	Kl cp'elk'stim Hatchery	H3,4,1	0 (2 year rotation)	Shingle Creek
2019	Sockeye	Kl cp'elk'stim Hatchery	H3,4,2	0 (2 year rotation)	Shingle Creek
2019	Sockeye	Kl cp'elk'stim Hatchery	H3,4,3	0 (2 year rotation)	Shingle Creek
2019	Pink	Nanaimo River Hatchery	H4	900	Nanaimo River, sea pen
2019	Pink	Quinsam River Hatchery	2,2H	3,000	Chef Cr, Englishman R, Headquarters Cr, Wilfred Cr, Mohun Cr, Nile Cr. Eyed egg exports
2019	Pink	Quinsam River Hatchery	2-2H	0	Quinsam R
				Totals by Species	
	Chinook			26,750,000	
	Chum			37,890,000	
	Coho			150,000	
	Pink			3,900,000	
	Sockeye			5,500,000	
	Grand Total 2019			74,190,000	