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## **Proposed Thermal Marks for Salmon from British Columbia for Brood Year 2004**

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# **Proposed Thermal Marks for Salmon from British Columbia for Brood Year 2004**

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## **Abstract**

In British Columbia thermal marking continues to play an important role for both research and for fisheries management. For 2004 it is proposed that a total of 41 thermal mark releases will take place from 12 hatcheries. The plan is similar to the marking proposal submitted for 2003 with a few additions. Additional marks will be applied to sockeye from Skaha Lake (Okanagan), chinook from Coldwater, Tahsis and Marble Rivers plus two additional releases from the Stamp/Somass River stock.

## **Introduction**

The primary use of thermal marking in British Columbia is to distinguish hatchery origin chinook and chum salmon from naturally spawned (wild) salmon in terminal fisheries and in spawning populations. Increasingly, thermal marks on sockeye are also being used to assess the success of stock rebuilding. 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 and survival of chinook salmon based on coded-wire tag studies. In addition they are being used to look at straying rates of chinook salmon, identify hatchery fish in studies on early marine distribution and survival, and to look at the interactions between hatchery and wild salmon.

## **Plan for 2004 brood year stocks**

The proposed thermal marking program for salmon in British Columbia for the 2004 brood year is shown in Table 1. The bulk of the proposal is similar to that submitted for 2003 (Till, J. 2003) and marks will remain the same except where prevented by operational constraints. Some additional stocks will be marked while others have been removed from the program. Key components of the plan in addition to the regular 'production' marks are as follows.

Continued thermal marking of sockeye stocks during rebuilding of Rivers and Smiths Inlets in the Central Coast will enable monitoring of migration, timing and contribution to fisheries and escapement. Continued application of marks to Woss and Vernon Lake sockeye will be used to assess the enhanced contribution to returns to the Nimpkish system. Gold and Burman River chinook in Nootka Sound will continue to be marked to assess straying rates, migration, timing and contribution to fisheries and for management of those fisheries. Marking of Quinsam River fed fry will be used to assess survival rates of chinook that more closely mimic their wild counterparts than the regular 'production' marks. Marks applied to both coho fry and smolts at Nitinat will allow comparative survival studies. A new mark applied to Skaha Lake (Okanagan) sockeye is to be used for long term assessment of both juvenile production and adult returns and will allow differentiation from other Columbia River adipose clipped stocks. New marks on both Coldwater and Marble River chinook will be used to assess hatchery contribution to escapements. Two additional marks on Stamp River (Somass) chinook will permit comparison of survival rates between estuary and river releases and between yearling and regular smolt releases.

The notation (including delimiters) used in Table 1 is consistent with the RBr system (Munk and Geiger 1998).

## References

Munk K.M. and Geiger, H.J. 1998. Thermal Marking of Otoliths: the “RBr” Coding Structure of Thermal Marks (NPAFC Doc. 367). Alaska Department of Fish and Game, Juneau Alaska 99801-5526 19p.

Till, J. 2003. Proposed thermal marks for salmon from British Columbia for brood year 2003. (NPAFC Doc. 711) 4 p. Fisheries and Oceans Canada, Nanaimo, British Columbia, Canada V9T 1K3.

**Table 1 Proposed Thermal Mark Releases from British Columbia for 2004 Brood Year**

Brood Year	Species	Facility	Release Site	Proposed Thermal Mark : RBr Code
2004	Chinook	Big Qualicum	Englishman River	2:1.6n
2004	Chinook	Chilliwack River Hatchery	Chilliwack River	2:1.7
2004	Chinook	Spius Creek Hatchery	Coldwater River	2:1.3,2.4
2004	Chinook	Conuma River Hatchery	Conuma River	2:1.5
2004	Chinook	Conuma River Hatchery	Sucwoa River	2:1.3
2004	Chinook	Conuma River Hatchery	Tlupana River	2:1.3
2004	Chinook	Conuma River Hatchery	Zeballos River	2:1.3
2004	Chinook	Conuma River Hatchery	Gold River	2:1.2,2.4
2004	Chinook	Conuma River Hatchery	Burman River	2:1.4,2.2
2004	Chinook	Conuma River Hatchery. Transferred to Tahsis Hatchery.	Tahsis River	2:1.9
2004	Chinook	Marble River Hatchery	Marble River	1:1.3,2.2,3.2
2004	Chinook	Nitinat River Hatchery	Nitinat River	2:1.2,2.3,3.2
2004	Chinook	Nitinat River Hatchery	Sarita River	2:1.3,2.2,3.3
2004	Chinook	Nitinat River Hatchery. Transferred to Goldstream Hatchery.	Esquimalt Harbour	1:1.4
2004	Chinook	Nitinat River Hatchery	Sooke River	1:1.4
2004	Chinook	Quinsam River Hatchery	Quinsam/Campbell River	2:1.2,2.2,3.2
2004	Chinook	Quinsam River Hatchery	Seapen off Campbell Estuary	2:1.2,2.2
2004	Chinook	Quinsam River Hatchery	Spawning Channel (Campbell R.)	1:1.3,2.4
2004	Chinook	Quinsam River Hatchery	Fed fry outplants to Upper Quinsam R.	1:1.2,2.4
2004	Chinook	Robertson Creek Hatchery	Stamp River	1:1.3
2004	Chinook	Robertson Creek Hatchery	Port Alberni Harbour	1:1.3,2.1,3.2
2004	Chinook	Robertson Creek Hatchery	Stamp River (Super smolts)	1:1.3,2.1,3.3
2004	Chinook	Robertson Creek Hatchery	Henderson Lake	1:1.5
2004	Chinook	Robertson Creek Hatchery	Nahmint River	1:1.3,2.2
2004	Chinook	San Juan Enhancement Soc.	San Juan River	2:1.3n
2004	Chum	Conuma River Hatchery	Conuma River	2:1.4
2004	Chum	Conuma River Hatchery	Conuma Estuary (seapen)	2:1.5
2004	Chum	Conuma River Hatchery	Canton River	2:1.2,2.2
2004	Chum	Conuma River Hatchery	Deserted River	2:1.2,2.2
2004	Chum	Conuma River Hatchery	Sucwoa River	2:1.2,2.3
2004	Chum	Conuma River Hatchery	Tlupana River	2:1.2,2.3
2004	Chum	Nitinat River Hatchery	Klanawa	3:1.3,2.1,3.3
2004	Chum	Nitinat River Hatchery	Nitinat River	1:1.3,2.1
2004	Coho	Nitinat River Hatchery	Nitinat River smolts	2:1.3
2004	Coho	Nitinat River Hatchery	Nitinat Lake fry	2:1.4
2004	Sockeye	Nimpkish River Hatchery	Woss Lake	1:1.3
2004	Sockeye	Nimpkish River Hatchery	Vernon Lake	1:1.3
2004	Sockeye	Snootli River Hatchery	Rivers Inlet (Owikeno Lake stocks) Wannock	1:1.3,2.5
2004	Sockeye	Snootli River Hatchery	Rivers Inlet (Owikeno Lake early stocks)	2:1.4,2.2
2004	Sockeye	Snootli River Hatchery	Smiths Inlet (Long Lake stocks)	2:1.4,2.4
2004	Sockeye	Shuswap River Hatchery	Skaha Lake (Okanagan stock)	2:1.3,2.3