

*Proposed Thermal Marks for Salmon from British  
Columbia for Brood Year 2003*

Jeff Till

Fisheries and Oceans Canada  
South Coast Stock Assessment  
Nanaimo, BC V9T 1K3  
CANADA

Submitted to the

**NORTH PACIFIC ANADROMOUS FISH COMMISSION**

By

CANADA

October 2003

**THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:**

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.

# **Proposed Thermal Marks for Brood Year 2003 Salmon in British Columbia**

Jeff Till

South Coast Stock Assessment. Fisheries & Oceans Canada.  
3225 Stephenson Point Road, Nanaimo, BC. V9T 1K3

## **Abstract**

In British Columbia thermal marking is playing an increasingly important role for both research and for fisheries management. In 2003 a total of 37 thermal marks will be applied to chinook, chum, sockeye and coho salmon from 9 hatcheries. The plan is similar to the marking proposal submitted for 2002. Additional marks will be applied to sockeye from Woss and Vernon Lakes, chinook from Englishman and Quinsam Rivers and coho from Nitinat. Some smaller marking programs have been terminated or were not undertaken in 2002 as initially proposed and will not be re-introduced.

## **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 identify hatchery fish in studies on early marine distribution and survival, and the interactions between hatchery and wild salmon.

## **Plan for 2003 brood year stocks**

The proposed thermal marking program for salmon in British Columbia for the 2003 brood year is shown in Table 1. The bulk of the proposal is very similar to that submitted for 2002 (Till, J. 2002) 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. New marks applied to Woss and Vernon Lake sockeye will be used to assess the enhanced contribution to returns to those systems. Continued application of marks to Gold and Burman chinook in Nootka Sound will be used to assess straying rates, migration, timing and contribution to fisheries and for management of those fisheries. A new mark applied to Quinsam fed fry will be used to assess survival rates of chinook that more closely mimic their wild counterparts. Marks applied to both coho fry and smolts at Nitinat will allow comparative survival studies.

The notation used in Table 1 is the RBr system (Munk and Geiger 1998). However, note that the delimiter '+' is used only to separate the thermal bands and is not an indicator of the magnitude of spacing between the bands.

### **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. 2002. Proposed thermal marks for salmon from British Columbia for brood year 2002. (NPAFC Doc. 652) 4 p. Fisheries and Oceans Canada, Nanaimo, British Columbia, Canada V9T 1K3.

**Table 1 Proposed Thermal Mark Releases from British Columbia for 2003 Brood Year**

<b>Brood Year</b>	<b>Species</b>	<b>Facility</b>	<b>Release Site</b>	<b>Proposed Thermal Mark : RBr Code</b>
2003	Chinook	Big Qualicum/Rosewall Creek	Englishman River	2:1.6n
2003	Chinook	Chilliwack River Hatchery	Chilliwack River	2:1.7
2003	Chinook	Conuma River Hatchery	Conuma River	2:1.5
2003	Chinook	Conuma River Hatchery	Sucwoa River	2:1.3
2003	Chinook	Conuma River Hatchery	Tlupana River	2:1.3
2003	Chinook	Conuma River Hatchery	Zeballos River	2:1.3
2003	Chinook	Conuma River Hatchery	Gold River	2:1.2+2.4
2003	Chinook	Conuma River Hatchery	Burman River	2:1.4+2.2
2003	Chinook	Nitinat River Hatchery	Nitinat River	2:1.2+2.3+3.2
2003	Chinook	Nitinat River Hatchery	Sarita River	2:1.3+2.2+3.3
2003	Chinook	Nitinat River Hatchery	Cheanna seapens (Pedder Bay) (Goldstream Hatchery)	1:1.4
2003	Chinook	Nitinat River Hatchery	Esquimault Harbour (Goldstream Hatchery)	1:1.4
2003	Chinook	Nitinat River Hatchery	Sooke	1:1.4
2003	Chinook	Nitinat River Hatchery	Toquart River	1:1.4
2003	Chinook	Quinsam River Hatchery	Quinsam/Campbell River	2:1.2+2.2+3.2
2003	Chinook	Quinsam River Hatchery	Seapen off Campbell Estuary	2:1.2+2.2
2003	Chinook	Quinsam River Hatchery	Egg Outplants to incubation boxes in Elk Falls Spawning Channel	1:1.3+2.4
2003	Chinook	Quinsam River Hatchery	Fed fry outplants to Upper Quinsam R.	1:1.2+2.4
2003	Chinook	Robertson Creek Hatchery	Stamp River	1:1.3
2003	Chinook	Robertson Creek Hatchery	Henderson Lake	1:1.5
2003	Chinook	Robertson Creek Hatchery	Nahmint River	1:1.3+2.2
2003	Chinook	San Juan Enhancement Soc.	San Juan River	2:1.3n
2003	Chum	Conuma River Hatchery	Conuma River	2:1.4
2003	Chum	Conuma River Hatchery	Conuma Estuary (seapen)	2:1.5
2003	Chum	Conuma River Hatchery	Canton River	2:1.2+2.2
2003	Chum	Conuma River Hatchery	Deserted River	2:1.2+2.2
2003	Chum	Conuma River Hatchery	Sucwoa River	2:1.2+2.3
2003	Chum	Conuma River Hatchery	Tlupana River	2:1.2+2.3
2003	Chum	Nitinat River Hatchery	Klanawa	3:1.3+2.1+3.3
2003	Chum	Nitinat River Hatchery	Nitinat River	1:1.3+2.1
2003	Coho	Nitinat River Hatchery	Nitinat River smolts	2:1.3
2003	Coho	Nitinat River Hatchery	Nitinat Lake fry	2:1.4
2003	Sockeye	Nimpkish River Hatchery	Woss Lake	1:1.3
2003	Sockeye	Nimpkish River Hatchery	Vernon Lake	1:1.4n
2003	Sockeye	Snootli River Hatchery	Rivers Inlet (Owikeno Lake stocks) Wannock	1:1.3+2.5
2003	Sockeye	Snootli River Hatchery	Rivers Inlet (Owikeno Lake <b>early</b> stocks)	2:1.4+2.2
2003	Sockeye	Snootli River Hatchery	Smiths Inlet (Long Lake stocks)	2:1.4+2.4