

NPAFC  
Doc. 947  
Rev. \_\_\_\_\_

*Proposed Thermal Marks for Salmon from British Columbia for  
Brood Year 2006*

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

July 2006

**This paper may be cited in the following manner:**

Till, J. 2006. Proposed thermal marks for salmon from British Columbia for brood year 2006. (NPAFC Doc. 947). 4p. Fisheries and Oceans Canada, Nanaimo, British Columbia, Canada V9T 1K3.

# **Proposed Thermal Marks for Salmon from British Columbia for Brood Year 2006**

Jeff Till

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

## **Abstract**

In British Columbia thermal marking continues to play an important role for both research and for fisheries management. For 2006 it is proposed that a total of 45 thermal mark releases will take place from 17 hatcheries. The plan is similar to the marking proposal submitted for 2005 with a few changes. New marks are proposed for one chinook stock on the East Coast Vancouver Island from Cowichan River and for 3 sockeye stocks from Lower Fraser River (Pitt River), Lower Skeena River (Lakelse) and West Coast Vancouver Island (Henderson Lake).

## **Introduction**

Thermal marks are being used to look at a number of different issues in British Columbia. They are being used to distinguish hatchery origin salmonids (chinook, chum, sockeye and coho) from naturally spawned (wild) salmon in terminal fisheries and in spawning populations. Thermal marks on sockeye and chinook 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 and to look at straying rates of chinook.

## **Plan for 2006 brood year stocks**

The proposed thermal marking program for salmon in British Columbia for the 2006 brood year is shown in Table 1. The bulk of the proposal is similar to that submitted for 2005 (Till, J. 2005) and marks will remain the same except where prevented by operational constraints. The installation of a new chiller system at Cowichan River hatchery on East Coast Vancouver Island (ECVI) will permit us to look at both hatchery contribution and time and location of harvest of depressed ECVI chinook stocks. Plans for a new chiller at Henderson hatchery will provide the opportunity to thermally mark sockeye. This will allow assessment of hatchery contribution to escapement and provide data on timing/location of this depressed sockeye stock to the Barkley Sound/Alberni Inlet fisheries.

Other key components of the plan in addition to the regular 'production' marks are as follows.

Gold and Burman River chinook in Nootka Sound (WCVI) 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 to assess survival rates of chinook that more closely mimic their wild counterparts than regular 'production' marks. Marks applied to both coho fry and smolts at Nitinat will allow comparative survival studies. Skaha Lake (Okanagan) sockeye marks will be used for long term assessment of both juvenile production and adult returns and will allow differentiation from other Columbia River adipose clipped stocks.

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. 2005. Proposed thermal marks for salmon from British Columbia for brood year 2005. (NPAFC Doc. 856) 4 p. Fisheries and Oceans Canada, Nanaimo, British Columbia, Canada V9T 1K3.

**Table 1 Proposed Thermal Mark Releases from British Columbia for 2006 Brood Year**

Brood Year	Species	Facility	Release Site	Proposed Thermal Mark : RBr Code
2006	Chinook	Big Qualicum	Englishman River	2:1.6n
2006	Chinook	Chilliwack River Hatchery	Chilliwack River	2:1.7
2006	Chinook	Conuma River Hatchery	Early seapen release.	2:1.5-2.2
2006	Chinook	Conuma River Hatchery	Late seapen release.	2:1.5-2.3
2006	Chinook	Conuma River Hatchery	Sucwoa River	2:1.3
2006	Chinook	Conuma River Hatchery	Tlupana River	2:1.3
2006	Chinook	Conuma River Hatchery	Gold River	2:1.2,2.4
2006	Chinook	Conuma River Hatchery	Burman River	2:1.4,2.2
2006	Chinook	Conuma River Hatchery. Transferred to Tahsis H.	Tahsis River	2:1.9
2006	Chinook	Cowichan River Hatchery	Cowichan River	1:1.5,2.2
2006	Chinook	Marble River Hatchery	Marble River	1:1.3,2.2,3.2
2006	Chinook	Nanaimo River Hatchery	Nanaimo River (summer run)	2:1.5
2006	Chinook	Nanaimo River Hatchery	Nanaimo River (fall run)	2:1.2/2.3
2006	Chinook	Nitinat River Hatchery	Nitinat River	2:1.2,2.3,3.2
2006	Chinook	Nitinat River Hatchery	Nitinat River	2:1.2,2.3,3.2,4.2
2006	Chinook	Nitinat River Hatchery	Sarita River	2:1.3,2.2,3.3
2006	Chinook	Nitinat River Hatchery. Transferred to Goldstream H.	Esquimalt Harbour	1:1.4
2006	Chinook	Nitinat River Hatchery	Sooke River	1:1.4
2006	Chinook	Nitinat River Hatchery	Sooke Harbour	2:1.2,2.3,3.2
2006	Chinook	Quinsam River Hatchery	Quinsam/Campbell River	2:1.2/2.2/3.2
2006	Chinook	Quinsam River Hatchery	Seapen off Campbell Estuary	2:1.2/2.2
2006	Chinook	Quinsam River Hatchery	Egg Outplants to incubation boxes in Elk Falls Spawning Channel (Campbell R.)	1:1.3-2.4
2006	Chinook	Quinsam River Hatchery	Fed fry outplants to Upper Quinsam R.	1:1.2-2.4
2006	Chinook	Quinsam River Hatchery	Salmon River	2:1.2/2.2/3.2/4.2
2006	Chinook	Robertson Creek Hatchery	Stamp River	1:1.3
2006	Chinook	Robertson Creek Hatchery	Henderson Lake	1:1.5
2006	Chinook	Robertson Creek Hatchery	Nahmint River	1:1.3-2.2
2006	Chinook	San Juan Enhancement Soc.	San Juan River	2:1.3n
2006	Chinook	Spius Creek Hatchery	Coldwater River	2:1.3,2.4
2006	Chinook	Zeballos River Hatchery	Zeballos River	2:1.3
2006	Chum	Conuma River Hatchery	Conuma River	2:1.4
2006	Chum	Conuma River Hatchery	Conuma Estuary (seapen)	2:1.5
2006	Chum	Conuma River Hatchery	Canton River	2:1.2,2.2
2006	Chum	Conuma River Hatchery	Sucwoa River	2:1.2,2.3
2006	Chum	Conuma River Hatchery	Tlupana River	2:1.2,2.3
2006	Chum	Nitinat River Hatchery	Klanawa	1:1.3,2.1
2006	Chum	Nitinat River Hatchery	Nitinat River	1:1.3,2.1
2006	Coho	Nitinat River Hatchery	Nitinat River smolts	2:1.3
2006	Coho	Nitinat River Hatchery	Nitinat Lake fry	2:1.4
2006	Sockeye	Henderson Lake Hatchery	Henderson Lake	1:1.2n,2.2
2006	Sockeye	Inch Creek Hatchery	Pitt River	2:1.4,2.2
2006	Sockeye	Nimpkish River Hatchery	Woss Lake	1:1.3
2006	Sockeye	Nimpkish River Hatchery	Vernon Lake	1:1.3
2006	Sockeye	Snootli River Hatchery	Lakelse	2:1.4,2.4
2006	Sockeye	Shuswap River Hatchery	Skaha Lake (Okanagan stock)	2:1.3,2.3