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Proposed Thermal Marks for Salmon from British Columbia for Brood Year 2010

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Abstract

In British Columbia thermal marking continues to play an important role for both research and for fisheries management. For the 2010 brood year we expect to thermally mark approximately 61 million salmon. This will include 40 different thermal marks applied at 13 hatcheries and released from 46 locations. The plan is similar to that proposed and carried out for the 2009 brood year. British Columbia's main production releases remain unchanged while a few smaller programs have seen some modifications to their marking.

Introduction

Thermal marks are being used to assess a number of different issues in British Columbia. Thermal marking in British Columbia continues to focus primarily on Chinook and Chum stocks with limited marking of Sockeye, Coho and Pink. It is used to distinguish hatchery origin salmonids from naturally spawned (wild) salmon in terminal fisheries and in spawning populations. Thermal marks on Sockeye, Chinook and Coho are also being used to assess different 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 and survival of Chinook salmon based on coded-wire tag studies and to look at straying rates of Chinook.

Plan for 2010 Brood Year Stocks

The proposed thermal marking program for salmon in British Columbia for the 2010 brood year is shown in Table 1. The bulk of the proposal is similar to that submitted for 2009 (Till, J. 2009) and proposed marks remain the same except where prevented by operational constraints. Important components of the plan in addition to regular 'production' marks include a 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 depressed ECVI stocks. Additionally, the use of multiple thermal marks at Nitinat River Hatchery for both Chinook and Coho will allow assessment of fast and slow growth rearing strategies for each species. Four different marks are being applied to Sockeye releases into Skaha Lake on a two year cycle to enable assessment of nearshore and offshore release strategies.

Modifications to Tahsis River Hatchery on WCVI in the summer of 2010 will give us the ability to thermally mark both Tahsis and Leiner River Chinook stocks locally instead of transferring them from Conuma River Hatchery.

Both RBr notation (Munk and Geiger 1998) and Uniform Hatch Code notation (Johnson et al. 2006) are shown for each release in Table 1.

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). 39p. Alaska Department of Fish and Game, Juneau, Alaska.

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

Till, J. 2009. Proposed Thermal Marks for Salmon from British Columbia for Brood Year 2009. (NPAFC Doc. 1165) 3 pp. Fisheries and Oceans Canada, Nanaimo, British Columbia, Canada V9T 1K3.

Table 1. Proposed Thermal Mark Releases from British Columbia for 2010 Brood Year.

| Brood Year | Species | Facility | Release Site | Proposed Thermal Mark: RBr Code | Proposed Thermal Mark: Hatch Code | Proposed Release (000) |
|------------|---------|---|---------------------------------------|---------------------------------|-----------------------------------|------------------------|
| 2010 | Chinook | Chilliwack River Hatchery | Chilliwack River | 2:1.7 | H7 | 1,000 |
| 2010 | Chinook | Chilliwack River Hatchery | Alouette River | 2:1.7 | H7 | 200 |
| 2010 | Chinook | Chilliwack River Hatchery | Coquitlam River | 2:1.7 | H7 | 200 |
| 2010 | Chinook | Chilliwack River Hatchery | loco Seapen | 2:1.7 | H7 | 20 |
| 2010 | Chinook | Chilliwack River Hatchery | Westridge Term Seapen | 2:1.7 | H7 | 20 |
| 2010 | Chinook | Conuma River Hatchery | Conuma Estuary. Early seapen release | 2:1.5-2.2 | H5-2 | 850 |
| 2010 | Chinook | Conuma River Hatchery | Conuma Estuary. Late seapen release | 2:1.5-2.3 | H5-3 | 850 |
| 2010 | Chinook | Conuma River Hatchery | Gold River/Muchalat River | 2:1.2,2.4 | H2,4 | 280 |
| 2010 | Chinook | Conuma River Hatchery | Sucwoa Estuary | 2:1.3 | H3 | 40 |
| 2010 | Chinook | Conuma River Hatchery | Tlupana Estuary | 2:1.3 | H3 | 40 |
| 2010 | Chinook | Conuma River Hatchery | Burman River | 2:1.4,2.2 | H4,2 | 400 |
| 2010 | Chinook | Cowichan River Hatchery | Cowichan River | 1:1.4-2.1 | 4-1H | 475 |
| 2010 | Chinook | Gwani Hatchery | Nimpkish River | 1:1.3,2.3n | 3,3nH | 500 |
| 2010 | Chinook | Marble River Hatchery | Marble River | 1:1.3,2.2,3.2 | 3,2,2H | 910 |
| 2010 | Chinook | Marble River Hatchery | Quatsino Sound | 1:1.3,2.2,3.3 | 3,2,3H | 90 |
| 2010 | Chinook | Nanaimo River Hatchery | Nanaimo River (summer run) | 2:1.5 | H5 | 180 |
| 2010 | Chinook | Nanaimo River Hatchery | Nanaimo River (fall run) | 2:1.2-2.3 | H2-3 | 350 |
| 2010 | Chinook | Nitinat River Hatchery | Nitinat River (production) | 2:1.2,2.3,3.2 | H2,3,2 | 1,500 |
| 2010 | Chinook | Nitinat River Hatchery | Nitinat River (semi natural small) | 2:1.2,2.3,3.2,4.2 | H2,3,2,2 | 750 |
| 2010 | Chinook | Nitinat River Hatchery | Nitinat River (semi natural large) | 2:1.2,2.3,3.2,4.3 | H2,3,2,3 | 750 |
| 2010 | Chinook | Nitinat River Hatchery | Sarita River (small) | 2:1.3,2.2,3.4 | H3,2,4 | 50 |
| 2010 | Chinook | Nitinat River Hatchery | Poetts Nook (small) | 2:1.3,2.2,3.4 | H3,2,4 | 150 |
| 2010 | Chinook | Nitinat River Hatchery | Sarita River (large) | 2:1.3,2.2,3.3 | H3,2,3 | 50 |
| 2010 | Chinook | Nitinat River Hatchery | Poetts Nook (large) | 2:1.3,2.2,3.3 | H3,2,3 | 150 |
| 2010 | Chinook | Nitinat River Hatchery. Transferred to Goldstream H. | Esquimalt Harbour | 1:1.4 | 4H | 170 |
| 2010 | Chinook | Nitinat River Hatchery. Transferred to Sooke H. | Sooke River | 1:1.4 | 4H | 128 |
| 2010 | Chinook | Nitinat River Hatchery | Sooke Harbour | 2:1.2,2.3,3.2 | H2,3,2 | 72 |
| 2010 | Chinook | Quinsam River Hatchery | Quinsam River | 2:1.2/2.2/3.2 | H2/2/2 | 1,900 |
| 2010 | Chinook | Quinsam River Hatchery | Campbell Estuary Seapens | 2:1.2/2.2 | H2/2/2 | 1,000 |
| 2010 | Chinook | Quinsam River Hatchery | Campbell River | 1:1.3-2.4 | 3-4H | 1,000 |
| 2010 | Chinook | Quinsam River Hatchery | Fed Fry Outplants to Upper Quinsam R. | 1:1.2-2.4 | 2-4H | 0 |
| 2010 | Chinook | Quinsam River Hatchery | Salmon River | 2:1.2/2.2/3.2/4.2 | H2/2/2/2 | 50 |
| 2010 | Chinook | Robertson Creek Hatchery | Stamp River | 1:1.3 | 3H | 6,000 |
| 2010 | Chinook | Robertson Creek Hatchery | Nahmint River | 1:1.3,2.2 | 3,2H | 225 |
| 2010 | Chinook | San Juan Enhancement Soc. | San Juan River | 2:1.3n/2.2 | H3n/2 | 720 |
| 2010 | Chinook | Tahsis River Hatchery | Tahsis River | 2:1.9 | H9 | 110 |
| 2010 | Chinook | Tahsis River Hatchery | Leiner River | 2:1.7,2.3 | H7,3 | 110 |

Table 1cont. Proposed Thermal Mark Releases from British Columbia for 2010 Brood Year.

| Brood Year | Species | Facility | Release Site | Proposed Thermal Mark: RBr Code | Proposed Thermal Mark: Hatch Code | Proposed Release (000) |
|------------|---------|------------------------|--|---------------------------------|-----------------------------------|------------------------|
| 2010 | Chum | Conuma River Hatchery | Conuma Estuary Seapen | 2:1.5 | H5 | 1,500 |
| 2010 | Chum | Conuma River Hatchery | Canton River | 2:1.2,2.2 | H2,2 | 1,000 |
| 2010 | Chum | Conuma River Hatchery | Sucwoa River | 2:1.2,2.3 | H2,3 | 1,000 |
| 2010 | Chum | Conuma River Hatchery | Tlupana River | 2:1.2,2.3 | H2,3 | 1,000 |
| 2010 | Chum | Nitinat River Hatchery | Nitinat River (late release) | 1:1.3,2.1 | 3,1H | 25,000 |
| 2010 | Chum | Nitinat River Hatchery | Nitinat River (early release) | 1:1.3,2.2 | 3,2H | 5,000 |
| 2010 | Coho | Nitinat River Hatchery | Nitinat River (smolts) | 2:1.3 | H3 | 100 |
| 2010 | Coho | Nitinat River Hatchery | Nitinat Lake (fry) | 2:1.4 | H4 | 100 |
| 2010 | Sockeye | Inch Creek Hatchery | Pitt River | 2:1.4,2.2 | H4,2 | 2,000 |
| 2010 | Sockeye | Gwani Hatchery | Woss Lake | 1:1.3 | 3H | 1,000 |
| 2010 | Sockeye | Gwani Hatchery | Vernon Lake | 1:1.3 | 3H | 500 |
| 2010 | Sockeye | Shuswap River Hatchery | Skaha Lake (nearshore) | 2:1.3,2.4 | H3,4 | 400 |
| 2010 | Sockeye | Shuswap River Hatchery | Skaha Lake (offshore) | 2:1.3,2.4,3.2 | H3,4,2 | 400 |
| 2010 | Pink | Nanaimo River Hatchery | Nanaimo River, Nanaimo Harbour, Pacific Biological Station | 2:1.4 | H4 | 1,000 |