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## **Proposed Thermal Marks for Salmon from Canada, Brood Year 2011**

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## **Abstract**

Thermal marking continues to play an important role for both research and fisheries management in Canada. Canada plans to thermally mark approximately 61 million Pacific salmon for release in 2012. Thermal marking will include 38 thermal marks applied at 13 hatcheries with marked salmon released at 39 locations. The plan is similar to that of the 2010 brood year released in 2011.

## **Introduction**

Thermal marking in Canada continues to focus primarily on Chinook and Chum stocks with limited marking of Sockeye, 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 and Coho 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 (Harkin et al. 2005).

## **Plan for 2011 Brood Year Stocks**

The proposed thermal marking program for salmon in Canada for the 2011 brood year is shown in Table 1; using the Uniform Hatch Code notation (Johnson et al. 2006). The bulk of the proposal is similar to that submitted for 2010 (Till 2010) and proposed marks remain the same except where prevented by operational constraints. Important components of the plan in addition to regular marks 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 will allow continued assessment of fast and slow growth hatchery rearing strategies as well as release locations for these 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.

## References

- Harkin, D. G., J. H. Clark, R. B. Deriso, J. C. Garza, G. S. Morishima, B. E. Riddell, C. Schwarz, and J. B. Scott. 2005. Report of the expert panel on the future of the coded wire tag recovery program for Pacific salmon. Report to the Pacific Salmon Commission. Vancouver, Canada. 243 p. Available from <[http://www.psc.org/info\\_codedwiretagreview.htm](http://www.psc.org/info_codedwiretagreview.htm)>
- Johnson, W. F., R. P. Josephson, T. R. Frawley, and D. S. Oxman. 2006. Revised web-based North Pacific salmon otolith mark directory. North Pacific Anadromous Fisheries Commission Doc. 971. 39 p. Alaska Department of Fish and Game, Juneau, Alaska.
- Till, J. 2010. Proposed Thermal Marks for Salmon from British Columbia for Brood Year 2010. North Pacific Anadromous Fisheries Commission Doc. 1241. 3 p. Fisheries and Oceans Canada, Nanaimo, British Columbia, Canada.

Table 1. Proposed Canadian thermal mark releases in 2011.

Brood Year	Species	Facility	Release Site	Hatch Code	Proposed Release (000's)
2011	Chinook	Chilliwack River Hatchery	Chilliwack River	H7	1,000
2011	Chinook	Chilliwack River Hatchery	Alouette River	H7	200
2011	Chinook	Chilliwack River Hatchery	Coquitlam River	H7	200
2011	Chinook	Chilliwack River Hatchery	loco Seapen	H7	20
2011	Chinook	Chilliwack River Hatchery	Westridge Term Seapen	H7	20
2011	Chinook	Conuma River Hatchery	Conuma River Estuary	H5-2	850
2011	Chinook	Conuma River Hatchery	Conuma River Estuary	H5-3	850
2011	Chinook	Conuma River Hatchery	Gold River	H2,4	280
2011	Chinook	Conuma River Hatchery	Sucwoa River Estuary	H3	40
2011	Chinook	Conuma River Hatchery	Tlupana River Estuary	H3	40
2011	Chinook	Conuma River Hatchery	Burman River	H4,2	400
2011	Chinook	Cowichan River Hatchery	Cowichan River	4-1H	500
2011	Chinook	Gwani Hatchery	Nimpkish River	3,3nH	500
2011	Chinook	Marble River Hatchery	Marble River	3,2,2H	910
2011	Chinook	Marble River Hatchery	Quatsino Sound	3,2,3H	90
2011	Chinook	Nanaimo River Hatchery	Nanaimo River	H5	180
2011	Chinook	Nanaimo River Hatchery	Nanaimo River	H2-3	350
2011	Chinook	Nitinat River Hatchery	Nitinat River	H2,3,2	1,500
2011	Chinook	Nitinat River Hatchery	Nitinat River	H2,3,2,2	750
2011	Chinook	Nitinat River Hatchery	Nitinat River	H2,3,2,3	750
2011	Chinook	Nitinat River Hatchery	Sarita River	H3,2,4	50
2011	Chinook	Nitinat River Hatchery	Poetts Nook	H3,2,4	150
2011	Chinook	Nitinat River Hatchery	Sarita River	H3,2,3	50
2011	Chinook	Nitinat River Hatchery	Poetts Nook	H3,2,3	150
2011	Chinook	Nitinat River Hatchery	Esquimalt Harbour	4H	170
2011	Chinook	Nitinat River Hatchery	Sooke River	4H	128
2011	Chinook	Nitinat River Hatchery	Sooke Harbour	H2,3,2	72
2011	Chinook	Quinsam River Hatchery	Quinsam River	H2/2/2	1,900
2011	Chinook	Quinsam River Hatchery	Campbell River Estuary	H2/2/2	1,000
2011	Chinook	Quinsam River Hatchery	Campbell River	3-4H	1,000
2011	Chinook	Quinsam River Hatchery	Salmon River	H2/2/2/2	50
2011	Chinook	Robertson Creek Hatchery	Stamp River	3H	6,000
2011	Chinook	Robertson Creek Hatchery	Nahmint River	3,2H	225
2011	Chinook	San Juan Enhancement Soc.	San Juan River	H3n/2	720
2011	Chinook	Tahsis River Hatchery	Tahsis River	H9	110
2011	Chinook	Tahsis River Hatchery	Leiner River	H7,3	110
2011	Chum	Conuma River Hatchery	Conuma River Estuary	H5	1,500
2011	Chum	Conuma River Hatchery	Canton River	H2,2	1,000
2011	Chum	Conuma River Hatchery	Sucwoa River	H2,3	1,000
2011	Chum	Conuma River Hatchery	Tlupana River	H2,3	1,000
2011	Chum	Nitinat River Hatchery	Nitinat River	3,1H	25,000
2011	Chum	Nitinat River Hatchery	Nitinat River	3,2H	5,000
2011	Coho	Nitinat River Hatchery	Nitinat River (smolts)	H3	100
2011	Coho	Nitinat River Hatchery	Nitinat Lake (fry)	H4	100
2011	Sockeye	Inch Creek Hatchery	Pitt River	H4,2	2,000
2011	Sockeye	Gwani Hatchery	Woss Lake	3H	1,000
2011	Sockeye	Gwani Hatchery	Vernon Lake	3H	500
2011	Sockeye	Shuswap River Hatchery	Skaha Lake	H3,3	450
2011	Sockeye	Shuswap River Hatchery	Skaha Lake	H3,3,2	450
2011	Pink	Nanaimo River Hatchery	Nanaimo River	H4	1,000
<b>Totals by species</b>					
	Chinook				21,315
	Chum				34,500
	Coho				200
	Sockeye				4,400
	Pink				1,000
	<b>Grand Total</b>				<b>61,415</b>