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Otolith Thermal Mark for Brood Year 2012 and Proposed Thermal Marks for
Brood Year 2013 Chum Salmon in Korea

by

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Abstract

Korea released 2.5 million and 4.1 million thermal marked chum salmon in March 2012 and 2013, respectively. The marks were 3,3nH for 2012(2011BY) and 3,1,2nH for 2013(2012BY). We will mark approximately 7.0 million chum salmon in BY 2013, which covers about 50% ~60% of release of BY 2013 chum salmon at Namdae-cheon (river). Chum salmon will be marked at Yangyang Salmon Station using only 1 thermal mark (3,2,1H).

Introduction

Tagging is an old tool in biology, and is economically valuable for aquaculture, stock assessment and fisheries management. Traditionally, tagging experiments consisting of clipping, punching of fins, attaching plastic cards, inserting coded wire tags and micro data loggers have been used to distinguish fish stocks, to determine the optimum period of release of juveniles, and to check growth condition of fishes. However, labor-intensive tagging experiment requires high costs. Furthermore, in many cases, researchers experienced difficulties in getting enough specimens of recovery, so scientists sought for alternative methods.

Otolith thermal marking is one of the alternatives, which makes distinct and recognizable patterns in the otolith structures by exposing the fish to different temperature regimes. Due to advantages of mass-marking and good mark retention, all NPAFC countries have been released juvenile salmon with otolith marking. Korea released 2.2 million thermal marked chum salmon in March 2006 and 5.0 million in March 2007 and 5.0 million in March 2008. The marks were 3,3nH for 2005 Brood Year (BY), 3,1,2H for 2006 BY, and 3,2,1H for 2007 BY. We will continue the otolith thermal marking on 2013 BY chum salmon to get the growth conditions and survival during the early ocean life stage, and to distinguish hatchery origins.

Thermal mark for BY 2012 stock

Korea released 4.1 million thermal marked chum salmon in March 2013. The mark was a 3,1,2H (1:1.3,2.1,3.2).

Plan for 2013 BY stock

Based on success of thermal mark experiment for BY 2005, BY 2006, BY 2007, BY 2008, BY 2009, BY 2010 and BY 2011 stocks, we will continue this experiment for the BY 2012 salmon. We will mark approximately 7.0 million chum salmon at Yangyang Salmon Station with 1 pattern, which covers about 50%~60% of release of BY 2013 chum salmon at Namdaecheon (river) (Table 1). Proposed thermal mark schedule for BY 2013 stock of Korean chum salmon is shown in Table 2. Thermal mark pattern is presented in both the RBr notation (Munk and Geiger 1998), with the modification by Hagen (1999).

References

- Hagen, P. 1999. A modeling approach to address the underlying structure and constraints of thermal mark codes and code notation. (NPAFC Doc. 395). 12 p. Alaska Dept. 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). 19 p. Alaska Dept. of Fish and Game, Juneau Alaska.

Table 1. Proposed thermal mark releases from Korea for 2013 brood year stocks of chum salmon.

No	BROOD YEAR	YEAR OF RELEASE	SPECIES	STATE/		AGENCY	FACILITY	STOCK	FINAL
				PROVINCE	REGION				RELEASE
K13-1	2013	2014	CHUM	GANGWON	EAST/JAPAN SEA COAST	yss	Yangyang Hatchery	Namdae- river	Namdae- river

No	REARING		ESTIMATED		HATCH	GRAPHIC IMAGE		MARKING
	TREATMENT	STAGE	RELEASE	RBr CODE	CODE	PREHATCH	POSTHATCH	SYSTEM
K13-1	Fed	fry	7,000,000	1:1.3,2.2,3,1	3,2,1 H	I I I	I I I	CHILLER

Table 2. Proposed thermal mark schedule for 2013 brood year stocks of Korean chum salmon.

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
K13-1	(2x)8C:12H,(1x)8C:24H, (1x)8C:12H, (1 x)8C:24H:8H	Down (12 to 8)	Spawning date: mid Oct.-late Nov.