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Otolith Thermal Mark for Brood Year 2006 and Proposed Thermal Marks
for Brood Year 2007 Chum Salmon in Korea

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Abstract

Korea released 2.2 million and 5.0 million thermal marked chum salmon in March 2006 and 2007, respectively. The marks were 3,3nH for 2006 and 3,1,2H for 2007. We will mark approximately 2.3 million chum salmon in 2008, which covers about 50% of release of BY 2007 chum salmon at Namdae-cheon (river). Chum salmon will be marked at Yeongdong Inland Fisheries Research Institute 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. The marks were 3,3nH for 2005 Brood Year (BY) and 3,1,2H for 2006 BY. We will continue the otolith thermal marking on 2007 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 2005 stock

Korea released 2.2 million thermal marked chum salmon in March 2006. The mark was a 3,3nH (1:1.3, 2.3n).

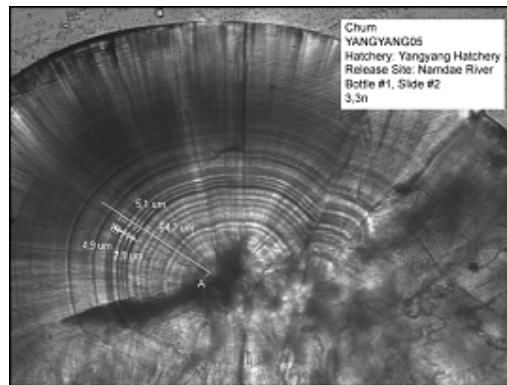


Fig. 1. Otolith thermal mark for 2005 brood chum salmon; 3,3nH (1:1.3, 2.3n).

Thermal mark for BY 2006 stock

Korea released 5.0 million thermal marked chum salmon in March 2007. The mark was a 3,1,2H (1:1.3,2.1,3,2).

Plan for BY 2007 stock

Based on success of thermal mark experiment for BY 2005 and BY 2006 stocks, we will continue this experiment for the BY 2007 salmon. We will mark approximately 2.3 million chum salmon at Yeongdong Inland Fisheries Research Institute with 1 pattern, which covers about 50% of release of BY 2007 chum salmon at Namdae-cheon (river) (Table 1). Proposed thermal mark schedule for BY 2007 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 2007 brood year stocks of chum salmon.

No	BROOD YEAR	YEAR OF RELEASE	SPECIES	STATE/ PROVINCE		AGENCY	FACILITY	STOCK	FINAL
				REGION	SEA COAST				RELEASE SITE
K07-1	2007	2008	CHUM	GANGWON	EAST/JAPAN	YDI	Yangyang Hatchery	Namdae-river	Namdae-river

No	REARING		ESTIMATED		HATCH CODE	G RAPHIC IMAGE		MARKING SYSTEM
	TREATMENT	STAGE	RELEASE	RBr CODE		PREHATCH	POSTHATCH	
K07-1	fed	fry	2,300,000	1:1.3,2.2,3,1	3,2, 1 H			CHILLER

Table 2. Proposed thermal mark schedule for 2007 brood year stocks of Korean chum salmon.

No	OTOLITH MARK SCHEDULE	TEMP SHIFT DIRECTION	COMMENTS
K07-1	(2x)8C:12H,(1x)8C:24H,(1x)8C:12H, (1x)8C:24H, (1x)8C:12H	Down (12 to 8)	Spawning date: mid Oct.-late Nov.