CHUM STOCK ID ASSESSMENT (CANADIAN AREA 3 COMMERCIAL FISHERY OTOLITHS): ADF&G COMPONENT

by

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EXECUTIVE SUMMARY

Thermal marks were recovered from chum salmon otoliths in southeast Alaska by the Alaska Department of Fish and Game (ADF&G) Thermal Mark Laboratory, Juneau as part of a multi-year chum salmon (*Oncorhynchus keta*) stock identification assessment. A sample of the 2011 and 2012 chum salmon otolith recoveries were read in fall 2012 and winter 2013 for thermal mark identification. There were 596 otoliths read from 2011 recoveries 938 were examined from 2012 recoveries for a total of 1,534.

Key words: Chum salmon, *Oncorhynchus keta*, Southeast Alaska, thermal mark, hatchery, otolith, reader agreement, *kappa*, latent class model

INTRODUCTION

Salmonid otoliths are thermal marked by exposing them to repeated temperature cycles that create patterns of optically dense bands (Volk et al. 1990). Thermal marking of salmonid otoliths is an effective tool for identifying hatchery salmon (Munk and Smoker 1991; Volk et al. 1990), because thermal mark identification is quick and fairly accurate (Hagen et al. 1995). Thermal mark identification is used by the Alaska Department of Fish and Game (ADF&G) for in-season management of Alaska's salmon stocks (TTC 1990) and for evaluation of program success at hatcheries. Recent studies have used thermal marks to document the presence and distribution of stray hatchery chum salmon (*Oncorhynchus keta*) in index streams throughout Southeast Alaska (Piston and Heinl 2011).

The objective for this project was to detect and identify chum salmon thermal marks for the Chum Stock ID Assessment (Canadian Area 3 Commercial fishery otoliths) project.

METHODS

Chum salmon otoliths were collected from Canadian Area 3 commercial fishery in 2011 and 2012. All sample data were entered into specialized applications, and mark summary results were immediately available online. Specimen results were queried from Microsoft Access, and results were saved in Microsoft Excel.

The chum salmon otolith recoveries were prepared for thermal mark examination in the ADF&G Thermal Mark Lab. First, the otoliths were cleaned with a chlorine solution (5%), rinsed with de-chlorine solution (0.7% thiosulfate), and then the otoliths were mounted on 1 by 2 in. glass slides with thermoplastic cement. Otoliths were examined for thermal mark presence by grinding the otolith on a grinder using 800 grit grinding paper until the primordia were visible under 200x magnification on a compound microscope. Fine polishing was performed by hand using 9µm grinding paper. Readers identified specimens as marked, unmarked, or unreadable. If a specimen was marked, readers used special codes (known as hatch codes) to delineate and identify the thermal mark identification (ADF&G 2011). For quality control, each specimen was independently read a second time for thermal mark presence and identification, then any conflicts between the two reads were resolved.

RESULTS AND DISCUSSION

During 2012 and 2013, ADF&G MTA Lab readers examined 596 samples from the 2011 chum salmon recoveries and 938 samples from 2012. For the 2011 recoveries, 571 otoliths were readable, and 481 were thermal marked. For the 2012 recoveries, 887 otoliths were readable, and 663 were thermal marked.

The 2011 and 2012 chum salmon thermal mark read results by specimen were delivered to Department of Fisheries and Oceans Canada Stock Assessment Biologist on February 5, 2013.

REFERENCES

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APPENDIX A. FINANCIAL STATEMENT OF EXPENDITURES

ADF&G Juneau (Mark, Tag, & Age Lab)

Line 100: Personnel
Details of the ADF&G (Juneau) budget are shown below. A total of 35 days of Fish and Wildlife Technician III time were required for otolith mounting, first reading, and second reading the core of the otolith for thermal mark presence and identification. A total of 10 days of Fish and Wildlife Technician IV time were required for the crew leader to training, supervise and provide data oversight. Total personnel cost was $15,927.

Line 200: Travel (none)

Line 300: Contractual (none)

Line 400: Supplies
Specimen slides for reading specimens were purchased. The total supplies cost: $3,070.

Line 500: Equipment (none)

Line 600: Indirect
The budget includes the ADF&G indirect cost rate of 14%. The indirect cost: $2,660.

Breakdown of project costs for ADF&G Mark Tag and Age Lab.

Personnel	Cost/hour	# days	Total
Fish and Wildlife Technician III			
Mounting	$48.29	4	$1,449
First Reading	$48.29	21	$7,605
Second reading	$48.29	10	$3,621
Fish and Wildlife Technician IV			
Crew leader	$43.36	10	$3,252
Total Personnel			$15,927
Supplies	Slides		$3,070
Administrative cost	14%		$2,660

TOTAL OVERAL COST	(US)$21,657