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 chum salmon otolith recoveries from the 2013 fisheries were read during winter 2014 to determine the presence of a thermal mark. From the 2013 fishery sampling, we received 958 samples of which 945 were readable. Of these, 642 (67.9%) were thermal marked, and the most common mark found was from fish released in Nakat Inlet. Nakat Inlet is a remote release site from Whitman Lake Hatchery, part of the Southern Southeast Regional Aquaculture Association.

Key words: Chum salmon, *Oncorhynchus keta*, thermal mark, hatchery, otolith

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 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 2013, as part of a continuing study. 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 200 x magnification on a compound microscope. Fine polishing was performed by hand using 9 µm 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 (ADF&G 2011). For quality control, each specimen was independently read a second time for thermal mark presence and identification, and then any conflicts between the two reads were resolved.

RESULTS AND DISCUSSION

From the 2013 fishery, ADF&G MTA Lab readers examined 958 samples of which 945 were readable. Of these, 642 (67.9%) were thermal marked, and 579 (61.2%) of those thermal mark recoveries were a Nakat Inlet mark. Nakat Inlet is a remote release site of the Whitman Lake Hatchery, part of the Southern Southeast Regional Aquaculture Association.

The 2013 chum salmon thermal mark read results by specimen were delivered to Department of Fisheries and Oceans Canada Stock Assessment Biologist on 24 May 2014.

We met all required timelines and objectives. We were unable to judge the benefits of this project. We provided the data to the Prince Rupert Department of Fisheries and Oceans office, and they utilized it in their fishery management.

A summary of the financial expenditures will be sent separately by ADF&G Headquarters. There was little deviation from the projected budget.

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