

2008 Lower Fraser River Sockeye Recreational Hook and Release Mortality Study

Preliminary Summary

Prepared by
J.O. Thomas & Associates Ltd.

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Background

- There are no mortality studies for sockeye caught and released in freshwater using recreational gear.
- In recent years, the Department has been using a 10% mortality rate to sockeye released in freshwater.
- Due to the nature of bottom bouncing, the majority of sockeye caught with this method are primarily hooked on the outside of the mouth or head. The location and degree of hooking injuries suggests that mortality rates should be low, but it needs to be quantified.

Introduction

- In 2007, the Cheam Band submitted a proposal to the Fraser Salmon & Watershed Program (FS&WP) to conduct a recreational hook and release sockeye mortality study. The study was not conducted.
- In 2008, the FS&WP lead the development of a comprehensive study design to estimate short-term release mortality on sockeye caught and released in the lower Fraser River recreational fishery.
- The study design team worked with First Nations, recreational anglers, consultants and Departmental employees to ensure agreement on study design, goals and implementation.

Study Design Team

- Project Biologist – Jim Thomas of J.O Thomas & Associates
- FRAFS, Pete Nicklin
- FS&WP, Andrew Stegemann
- DFO Stock Assessment, Sue Grant, Richard Bailey, Jason Mahoney, and Joe Tadey
- DFO Resource Management, Debra Sneddon
- DFO Science, David Patterson

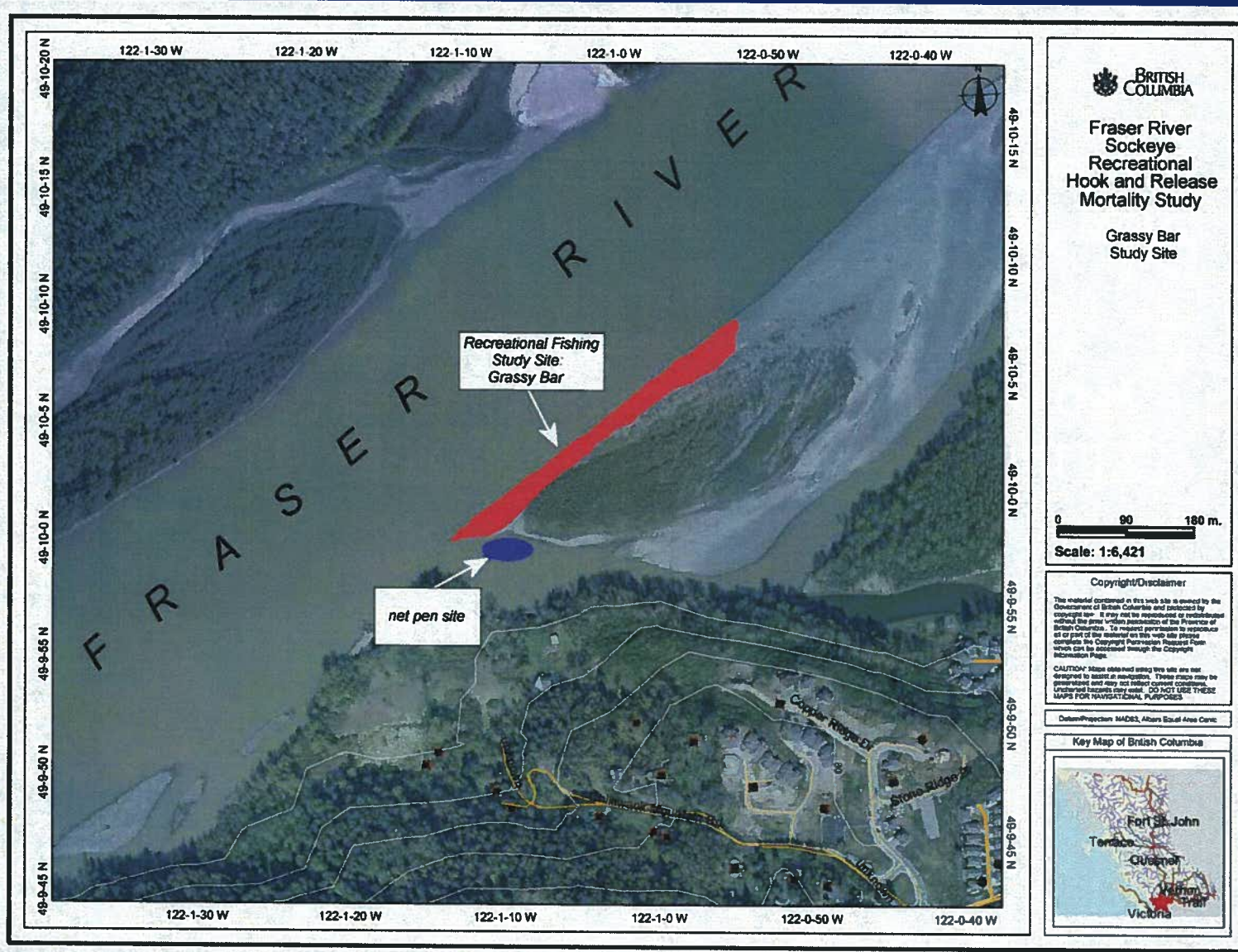
Objectives

- The primary objective of the study was to estimate the short-term (24 hour) mortality of hooked sockeye in a recreational catch & release fishery that commonly occurs in the Fraser River.
- A secondary objective was to assess the influence of selected variables like hooking location, hook size, leader length, etc. on hooking mortality rates.

Methodology

- Sockeye were caught by anglers using a range of gear and angler experience.
- Handling methods were representative of catch and release practices common during in-river sockeye recreational fisheries.
- A control group of sockeye was included in the study to estimate the mortality associated with handling, fish transport, and holding in net pens separately from hooking mortality.

Study Location



Results:

Angling and Control Group Catch and Effort

- Angling effort ranged from 5 to 24 anglers per day. The average daily number was 10.
- Approximately 203 sockeye were hooked and 173 sockeye were landed by anglers over the 14 day study period from Aug 5 to Sep 2.
- A total of 103 sockeye control group sockeye were captured by beach seine and held for observation over four separate days.

Shore-based volunteer anglers fishing at Grassy Bar...



Retrieving a hooked sockeye...



Beach seining for control group sockeye...



Results – cont'd

Angling Variables

- Leader lengths ranged from 8 to 16 feet. 77% of the leader lengths were between 10 and 12 feet.
- Hook sizes used in the fishery varied from size 1 to 4/0. 77% of hooks used were 3/0.
- 98% of the angled sockeye in the study were hooked by shore-based anglers and 2% were from anglers in boats.

Typical bottom bouncing gear...



Results – cont'd

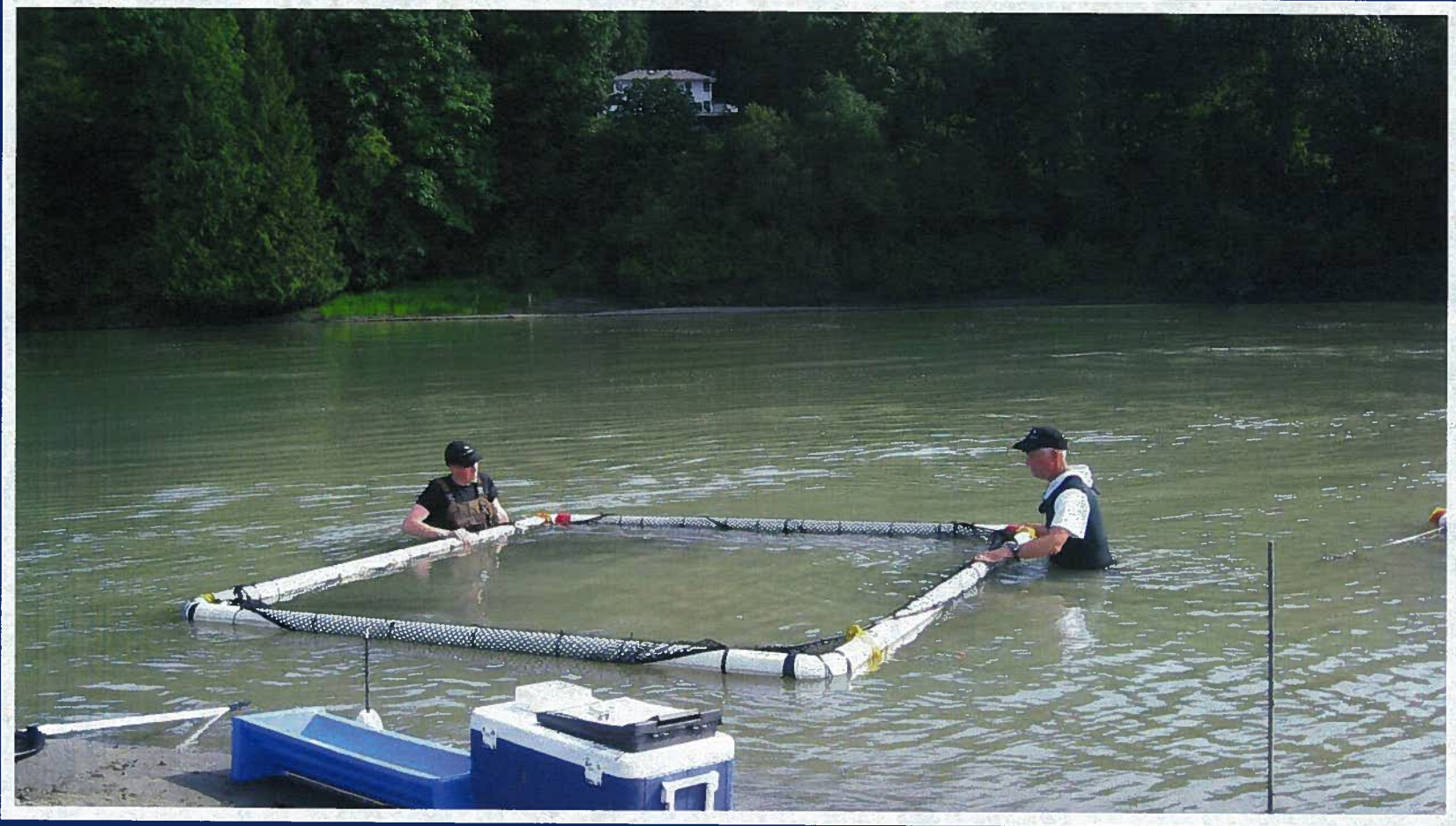
Hooking Locations & Fish Condition

- 88% of the sockeye landed were hooked on the outside of the mouth or body and 12% were hooked on the inside of the mouth.
- 75% of the sockeye hooked on the outside of the mouth or body, were hooked in the maxillary bone (and usually on the left side).
- 98% of the hooked sockeye were vigorous at time of landing. 82% showed no signs of bleeding; 12% had light, and 6% had moderate bleeding.

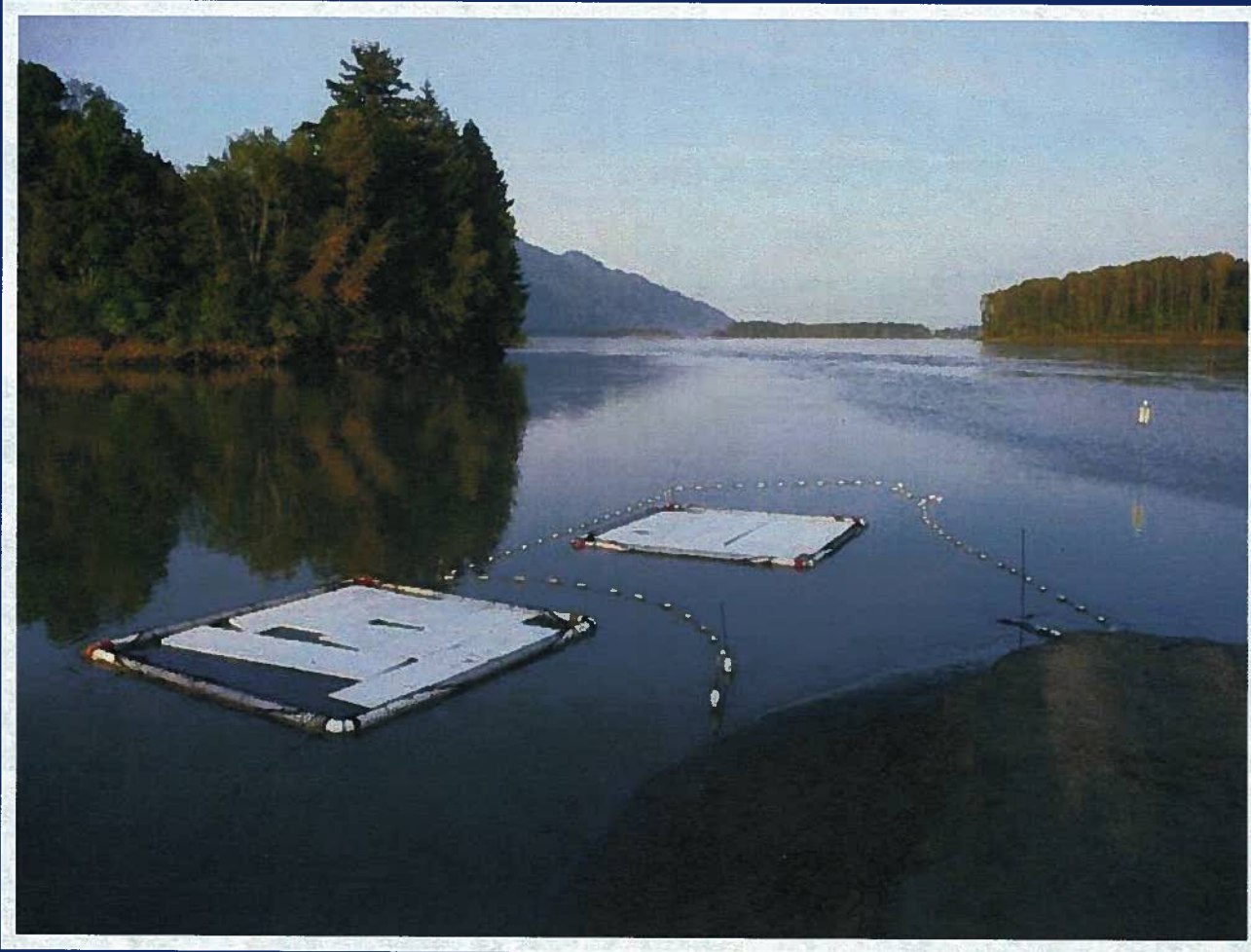
Typical sockeye hooking location in left maxillary...



Assembling the net pen used for holding sockeye...



Net pens with predator net enclosure...



Transferring a sockeye to the net pen after tagging...



Results – cont'd

Release Condition

- 98% of the hooked sockeye held for 24 hours were released in a vigorous and not bleeding condition. 1% of the hooked sockeye (2 fish) were lethargic and not bleeding when released.
- No control fish died during the study, suggesting that handling, transferring, and holding were negligible factors in overall mortality.

Releasing a live sockeye after holding for 24 hours...



Results – cont'd

Mortality Estimates

- Of the 173 sockeye hooked, only two died after the 24 hour holding period, representing a delayed hooking mortality rate of 1.2%.
- Necropsies on the two dead fish revealed that only one of the mortalities could be directly attributed to a hooking injury that occurred on the ventral surface and mortally damaged vital internal organs.
- The other sockeye that died had a concurrent and severe seal bite to the dorsal surface that was believed to be the primary cause of death.

Results – cont'd

Physiological Sampling

- Samples of blood and tissue were taken from about 20% of the sockeye over the course of the study to assess physiological condition at time of capture or release.
- Samples were taken from both the control and the angled groups.
- This data will yield information on stress response, muscle exertion, disease, osmoregulation, fat levels, and DNA.

Physiological sampling team...



Results – cont'd

Environmental Sampling

- Periodic stream flow velocity measurements and air and water temperatures were taken throughout the study period.
- Continuous in-river water temperatures were collected at the both the angling site and the net pen site.

Water temperature profiles at the angling site and at the net pen site...

2008 Fraser River Recreational Sockeye Hook & Release Mortality Study - Water Temperature Profiles

