The Role of Fishwheels in the Assessment and Management of Interior Fraser River Coho Salmon, 1998 to 2000

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Presentation Outline

- Introduction/rationale
- Program and presentation objectives
- Study area
- Methods, results, summary
- Discussion and implications

Introduction

- Stock assessment:
  - process of developing advice
  - advice is provided to fisheries managers
  - a structured approach to providing advice on resource status and the impacts of harvest using available information

Introduction

- Fisheries management
  - harvest
  - status of the fish resource
  - probable outcomes of harvest
  - fishing plans outline who fishes, at what level, permitted or prohibited methods, where and when fishing is permitted or prohibited

Background

- Interior Fraser coho salmon have been in the lime light over the past decade
- Stock assessment has provided advice on their status to fisheries management
- Fisheries management has implemented restrictions on Canadian fisheries to reduce mortalities

Background

- Recent stock assessment investigations (Irvine et al. 2000) indicated:
  - their status was poor based on information collected up to 1999
  - the understanding of their status was weak

Background

- One of Irvine et al. (2000)'s recommendations indicated:
  - inconsistencies in the survey methodology among systems and years
- They recommended:
  - escapement methodologies should become more standardized
  - commentaries on these methodologies should be available to reliably use escapement data

Rationale

- Coho salmon are difficult to count and develop escapement estimates
  - late and protracted spawning period (Oct.-Feb.)
  - they exist in numerous small populations in large numbers of rivers
  - many of these rivers have poor access
  - poor weather conditions frequent the enumeration period which influence instream visibility (eg. fall rain and rain-on-snow events, ice conditions)

Rationale

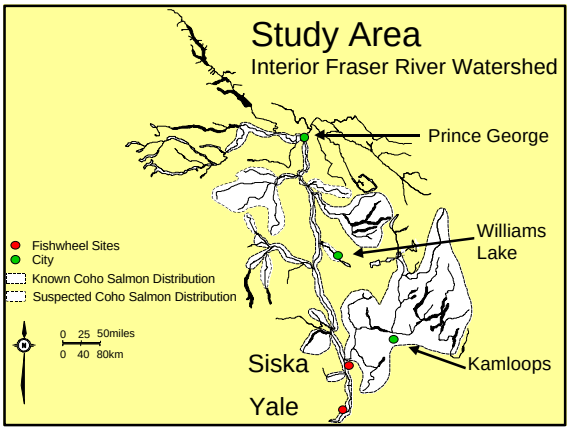
- 3 types of coho assessment studies
  - system studies provide an understanding of the status of the entire population within the Fraser River (eg. fishwheels)
  - intensive studies focus on the status of a few small populations and provide an understanding of freshwater and marine mortality (eg. indicator stocks)
  - extensive studies focus on the status of many small populations (eg. stream walks)

Fishwheel Program Objectives

- Generate spawner escapement estimate for interior Fraser coho by mark-recapture
- Coho stock composition and migration timing for coho and co-migrating species
- Improve stock assessment capacity of First Nations personnel

Presentation Objectives

1. Describe the fishwheel sampling operations
2. Summarize coho migration timing by the fishwheels
3. Describe the fishwheels 'system study' for monitoring coho returns to the interior Fraser River watershed



Objective 1.
Fishwheel Sampling Operations

- Methods
  - Yale First Nation and Siska Indian Band secured funding from Fisheries and Oceans (HRSEP, AFS, selective fisheries, StAD) for fishwheel operations
  - Fishwheels were operated at Gordon Creek and the Wall site by the Yale First Nation
  - One fishwheel was operated at Siska by the Siska Indian Band

Gordon Creek
1999 and 2000

Wall Site
1998 and 2000

Siska
2000

Siska
2000

Fish Sampling in 2000

- Fish identified to species and counted
- Coho
  - tagged, operculum punch
  - individual fish data
- Chinook
  - operculum punch
  - individual fish data

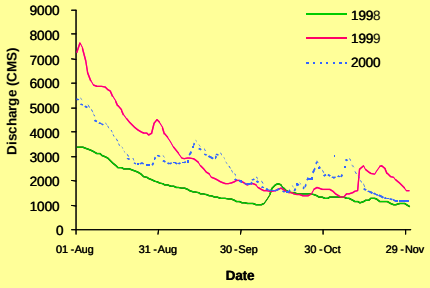
Total Catch Summary

	Yale		Siska
	GC	Wall	
1998	no sampling	2,215	no sampling
1999	26,283	no sampling	no sampling
2000	2,087	541	1,109

Coho Catch Summary

	Yale		Siska
	GC	Wall	
1998	no sampling	374	no sampling
1999	119	no sampling	no sampling
2000	659	85	554
Tagged	611	64	514

Fraser River Discharge

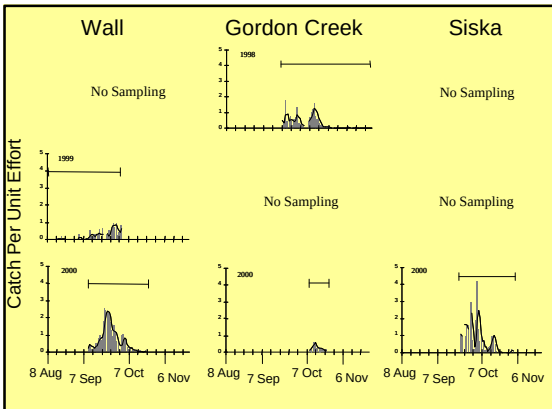


Objective 1: Summary

- Yale and Siska ran the fishwheels and improved their stock assessment capacity
- Years with high returns of salmon present operational challenges
- In 2000, 675 coho were tagged near Yale and 514 near Siska
- Some fishwheel sites may be limited by Fraser River discharge levels

Objective 2. Coho Migration Timing

- Methods
  - Catch per unit effort (coho/hr) was an indication of in-river abundance
  - Catch per unit effort calculations differed between years of high and low pink salmon abundance



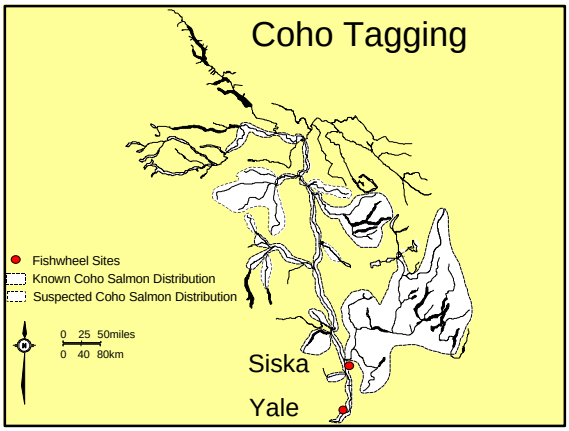
Objective 2: Summary

- Most coho appear to migrate through the Fraser River Canyon during September and October

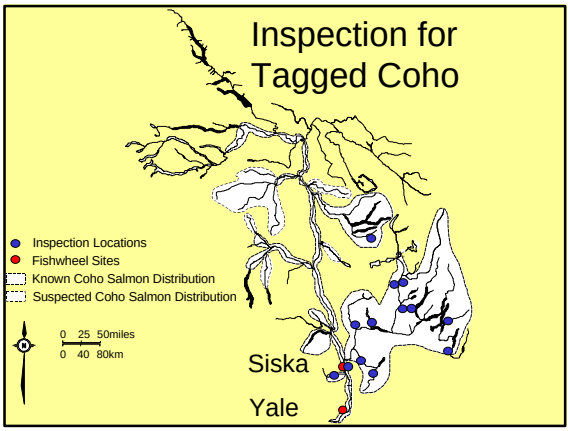
Objective 3. Fishwheels System Study

- Methods
  - mark-recapture study design
  - coho salmon were captured and tagged at fishwheels near Yale and Siska
  - coho salmon were inspected for tags at the spawning tributaries

Coho Tagging



Inspection for Tagged Coho



Sampling Designs

- Different tag colours and numbers are used at Yale than at Siska
- We can develop estimates of the coho returns swimming by Yale and by Siska
- The difference between the estimates indicates
  - returns to Nahatlatch and other Fraser Canyon rivers + in-river mortalities

Objective 3: Summary

- Fishwheel system study relies on information collected by First Nations and others throughout the interior Fraser River watershed
- Data are being assembled from coho tag inspection locations to estimate the total number of coho returning to the interior Fraser River watershed

Objective 3: Summary

- We have a weak understanding of coho distribution and returns in the non-Thompson systems

Overall Summary

1. Local First Nations and DFO successfully ran a multi-fishwheel program and tagged 1,189 coho bound for the interior Fraser
2. Most coho migrate through the canyon during September and October
3. Information collected by First Nations and others throughout the watershed will be used to develop a mark-recapture estimate of total coho returns to the interior Fraser

Discussion and Implications

- Fishwheels system study assists with the assessment of interior Fraser River coho
  - develops estimates of the total returns with consistent methodology
  - study design uses information collected from existing coho escapement monitoring programs
  - problems associated with counting coho at spawning locations are less influential on the fishwheels system study design than some of the other escapement monitoring studies

Discussion and Implications

- Information collected by the fishwheels was developed into advice and provided to fisheries managers
  - PSARC report by Irvine et al. (2000)
  - migration timing at Yale and Siska
  - future reporting by DFO StAD

Discussion and Implications

- Program plans for 2001 include
  - Repeat the study by operating the fishwheels during the coho migration period, tagging coho and inspecting for tags among coho at the spawning rivers
  - Build contacts and capacity to examine coho for tags in other spawning areas, especially non-Thompson systems