

# **Final Report of the Cowichan River Terminal Allocation and Management Framework**

## **SP3- A020**

### **Background**

The Cowichan River drains one of the largest watersheds on Vancouver Island (Fig. 1). The river supports coho, chinook and chum salmon populations. There are multiple stakeholders using the salmon resources and there typically is conflict over competing use of these stocks. Stakeholders include First Nation bands, recreational fishers, commercial fishing industry, local enhancement society and habitat users (e.g. forestry companies, municipality).

For example, the 50-year average coho escapement to the system is approximately 30,000. Over the last 20 years, the average reported escapement is 15,000. Major factors likely contributing to the recent low abundance of coho in the Cowichan River are poor marine survival rates and over-harvest of the stock. Habitat loss and habitat degradation are other factors contributing to the decline, prompting community groups within the watershed to undertake habitat enhancement and rehabilitation projects.

With major historical harvesting severely curtailed (commercial troll), coho stocks are rebuilding, and it is anticipated that there will be higher than past returns to the terminal areas. Returning stocks will be the subject of considerable discussion, focusing on questions such as: 1) whom should harvest these stocks (FN, commercial, recreational), 2) where should these stocks be harvested (in-river, estuary), 3) how should the catch be estimated and 4) how should any surpluses be determined. These questions, which will need to be answered before any harvesting occurs, are relevant not only to coho, but also to other species (chum and chinook) as they become more abundant terminal areas.

Thus, there is a need for the development of a terminal coho harvest model, similar to the terminal allocation models (TAM) used in the US, for the effective management of Cowichan River stocks. The Cowichan River area was chosen as the site of the first TAM type implementation in Canada, in large part because of the significant controversy over terminal fisheries issues over the past number of years. Due to the complexity of stocks and resource users in the Cowichan River, the development of a terminal harvest model for this area will provide a template for other terminal areas facing similar issues.

In addition, the development of a terminal harvest strategy (THS) for Cowichan River coho stocks is required to implement Abundance Based Management (ABM) as specified by the Pacific Salmon Treaty (PST). The Fishery Regulation Assessment Model (FRAM) is the main tool used to manage impacts in marine (Canada and US) coho fisheries. In the US, TAMs provide the framework for managing terminal coho fisheries. Both models are required to implement ABM, which require coho escapement targets, annual stock abundance assessments (including pre-season forecasts for the stock), and a formal process for managing the terminal allocation. Achieving these objectives requires a formal decision-making process to build consensus among terminal users.

### **Project Objectives**

In summary, the program objectives were to:

- 1) Develop a Terminal Harvest Strategy (THS) similar to the US Terminal Allocation Model (TAM), based on stock abundance and status, and habitat-based coho escapement goals for the Cowichan River/Watershed.
- 2) Produce a template document describing the procedure used to establish a terminal harvest strategy – i.e. the shift from perpetual conflict to consensus building among user groups (fisheries, habitat, and water), regarding agreed upon stock conservation and harvest objectives.

- 3) Produce a Watershed-based Fish Sustainability Plan – a document describing limiting factors to salmonid production in the watershed, potential opportunities for stock/habitat rehabilitation, and stock assessment requirements.
- 4) Develop a framework for providing annual salmon forecasts and in season abundance estimates for salmon returns to the Cowichan River watershed.

### **Project Description / Deliverables**

In order to develop the THA, three main tasks needed to be initiated. First, the best available stock status data was required to be assembled and synthesized to develop escapement target strategies. Second, an annual assessment plan to estimate coho population abundance was required to be generated and implemented. Third, a formal process was required for managing the terminal allocation and coordinating enhancement and re-mediation activities towards reduced user conflict and long-term sustainability of the salmonid populations.

With respect to the first objective, several studies of the local salmonid populations, particularly coho and chinook, have been completed over the years. These data have been summarized (Appendix IV) and will continue to be analyzed to develop escapement targets, habitat requirements, and optimum water use with the objective of maximizing fish production potential (Appendix I). Data have been analyzed to identify factors limiting coho production in the watershed. Data sources used include published studies of the local salmon population, stock assessment reports from previous coho sampling programs (juvenile and adult), DFO catch statistics, water/land use and geographical data available through federal and provincial spatial data sets, habitat surveys completed by local community groups, and local traditional ecological knowledge (TEK). Models used to determine escapement targets have incorporated stock-recruit and habitat-production relationships. Water use agreements will maximize fish production. Escapement goals will provide a crucial component of the harvest plan.

The second objective is to generate a long-term assessment program (Appendices V and VI) for determining terminal run size. This program will require information like annual estimates of smolt abundance generated through downstream trapping program. Marine survival rate forecasts are already available annually for nearby coho indicator stocks (e.g. Black Creek, Big Qualicum Hatchery). Acceptable methodology on assessment techniques to determine stock status (catch, escapement, stock ID etc) are detailed in a draft status paper enclosed. Other methods are currently under discussion, such as test fisheries, acoustic counters, alternate downstream enumeration of juveniles and newly developed creel census.

Regarding the third objective of creating a formal process for managing the terminal allocation, a steering committee of interested stakeholders is in the process of being convened. This committee will include representatives from federal and provincial agencies (Department of Fisheries and Oceans, Ministry of Sustainable Resource Management, Ministry of Forestry) and representatives from interested stakeholder groups including local First Nations, Sport Fishery Advisory Board, commercial fishing groups, and the Cowichan Lake Salmon Enhancement Society. A technical team of agency biologists have been selected to provide the committee with support and analyses.

After several meetings and lengthy discussion a PowerPoint presentation has been developed for the stakeholders. The goal of the presentation is to engage Cowichan Tribes, terminal recreational and terminal commercial harvesters in roundtable discussions. The approach that will be used in a series of presentations will:

- a) Provide information on local stocks, their management, and the round table process,
- b) Provide information on decision guidelines and suggested templates for each fishery,
- c) Provide suggestions for round table roles and tasks.

The initial draft presentation (Appendix II) is build around the following ideas:

- To make it easier to follow by carrying a consistent visual clue through a sequence of slides (e.g. life cycle diagram).
- To visually show some very crucial elements (e.g. changes in abundance and productivity).

- To emphasize the link between the 3 roundtables and different stages in the chinook life cycle.
- To link details about stock assessment to some basic questions.

In addition, data in both detailed and summary form have been developed for the steering committee. The objective of creating a standard information package (Appendix III) is:

- the development of a 1-2 page summary of the most relevant data as a basis for discussing each local stock, and
- the creation of an Excel spreadsheet to make annual updating easy.

This steering committee shall set its own terms of reference, but shall be initiated by the desire to develop a terminal harvest strategy (THS). The THS shall be based on biological escapement targets, consensus-building and the desire to reduce conflict among terminal users for the mutual benefit of conserving salmon stocks. Moreover, the committee shall develop a strategy in conjunction with Cowichan watershed planning according to the Watershed Based Fish Sustainability Planning (WFSP) process, which is a cooperative initiative between the province of British Columbia and the federal government of Canada, designed to ensure the long-term conservation of fish and fish habitat. The THS process is one of three processes which comprise the WFSP plan. The components of this watershed plan are: 1) Water Use; 2) Production; 3) Harvest.

This plan will identify factors limiting production (including over-harvest), set realistic stock objectives, and coordinate and prioritize rehabilitation and assessment efforts within the watershed. Using the WFSP process, common objectives can be set for the terminal allocation model based on the best available scientific information.

### **Benefits**

This project will be beneficial to both the resource and the community. Benefits to the resource include improved management of the Cowichan River salmon stocks leading to long-term sustainability of the populations. This will be accomplished through:

- the establishment of habitat-based escapement targets,
- the establishment of allowable harvest rates that are based on stock abundance and productivity,
- and the development of a watershed plan that identifies limiting factors and opportunities to enhance/maintain production of coho and other salmonids within the watershed.

Expected benefits to the community include a reduction of conflict among terminal users through the entrenchment of a formal decision making process, the development of a watershed plan, and through increasingly stable harvest opportunities. This will be accomplished through:

- the establishment of a formal process to identify issues within the watershed and generate solutions, thereby reducing conflict and increasing cooperation among stakeholders,
- achieving more stable salmon returns by reducing over-exploitation in the terminal area,
- and potentially enjoying more harvest opportunities resulting from improved assessment, management objectives, and cooperation among stakeholders.

## Budget

The allocated Pacific Endowment Fund budget was \$35,000 (Canadian funds). The DFO in-kind contribution was estimated at \$21,400. The overall total budget was \$56,400. Estimated Endowment Fund and DFO in-kind costs are shown below, with actual expenditures detailed in Table 1:

<u>Direct</u>			
facilitator's time – 50 days @ \$400/day	=	\$20,000	
reporting, publication	=	\$7,000	
meeting room rental	=	\$6,000	
hospitality	=	\$800	
transportation to meetings	=	<u>\$1,200</u>	
<i>Total</i>		<i>\$35,000</i>	
<u>DFO – in kind</u>			
technical support – EG-04 @ \$187.5/day	=	\$10,000	
manager support – BI-2 @ \$248/day	=	\$5,000	
office supplies	=	\$200	
telephone costs	=	\$200	
photocopies & printing	=	\$500	
transportation to meetings	=	\$500	
other agency support (BC, Env Can)	=	<u>\$5,000</u>	
<i>Total</i>		<i>\$21,400</i>	
<b>Total costs</b>	<b>=</b>	<b>\$56,400</b>	

Table 1. Actual Cowichan River Terminal Allocation and Management Framework project expenditures.

Date	Supplier	Item	Cost
01-Jan-05	Karin Mathias	Term	\$ 840.29
01-Jan-05	Karin Mathias	Term	\$ 1,750.62
01-Feb-05	Karin Mathias	Term	\$ 2,232.19
01-Feb-05	Karin Mathias	Term	\$ 840.30
12-Oct-04	J. A. Taylor and Asso.	Evaluate Cow Coho MR parameters	\$ 1,000.00
17-Feb-05	Diewert Consulting Services	Update PSAR Document	\$ 5,136.00
17-Feb-05	Diewert Consulting Services	GST	\$ 672.00
17-Feb-05	Diewert Consulting Services	Update PSAR Document	\$ 4,464.00
17-Feb-05	Diewert Consulting Services	GST	\$ 672.00
17-Feb-05	Diewert Consulting Services	GST	\$ (672.00)
17-Feb-05	Diewert Consulting Services	Analysis of Habitat Based Esc Goals	\$ 1,650.00
17-Feb-05	Diewert Consulting Services	GST	\$ 115.50
09-Nov-04	Cowichan River Hatchery	November-in-River Monitor Coho Fishery	\$ 2,080.00
07-Dec-04	Cowichan River Hatchery	November-in-River Monitor Coho Fishery	\$ 772.96
26-Nov-04	Al Eden & Associates	ECVI Swim Survey	\$ 266.58
10-Jan-05	Al Eden & Associates	ECVI Swim Survey	\$ 797.82
10-Jan-05	Al Eden & Associates	ECVI Swim Survey	\$ 55.85
28-Dec-04	MJ Lough Environmental Consultants	Cowichan River Snorkel	\$ 273.50
11-Jan-05	MJ Lough Environmental Consultants	Cowichan River Snorkel	\$ 506.64
05-Jan-05	Cowichan Valley Regional District	Water Use Plan	\$ 2,500.00
15-Mar-05	SOLV Consulting Ltd.	Presentation for Cowichan River	\$ 3,852.00
30-Mar-05	SOLV Consulting Ltd.	Presentation for Cowichan River	\$ 5,136.00
01-Apr-05	FRAM - Terminal Mgmt Framework	Total Costs	\$ 34,942.25

## Project Schedule

Progress to date on all key activities:

- 1) A technical team of agency biologists has been assembled. A review of available stock and habitat data has been completed.
- 2) Available stock data and information has been developed into a presentation for the stakeholder steering committee as it relates to terminal harvest allocation in the Cowichan River.
- 3) Escapement targets have been assessed, based on best available stock and habitat information.
- 4) Allowable terminal harvest rates have been discussed to provide potential non-terminal fisheries (i.e. based on productivity and abundance).
- 5) The development of the stakeholder steering committee, facilitating a consensus-building process for terminal harvest allocation is in progress.
- 6) A Cowichan River watershed has separate water use and stewardship plans under development. The terminal harvest strategy plan will be the third component of an overall watershed plan.

## Monitoring and Evaluation

The project is monitored by Fisheries and Oceans Departmental staff through planned meetings and scheduled reviews. The monitoring was essentially a judgemental process as the strategy was to meet a specific watershed plan which required many one time unique solutions. Evaluation was largely based on a timeline. The project was slow to start with, as it was contingent on other watershed processes and as a result was late in completing. Fisheries and Oceans have established the process in this particular watershed as a South Coast area priority, and will continue to refine this harvest strategy.

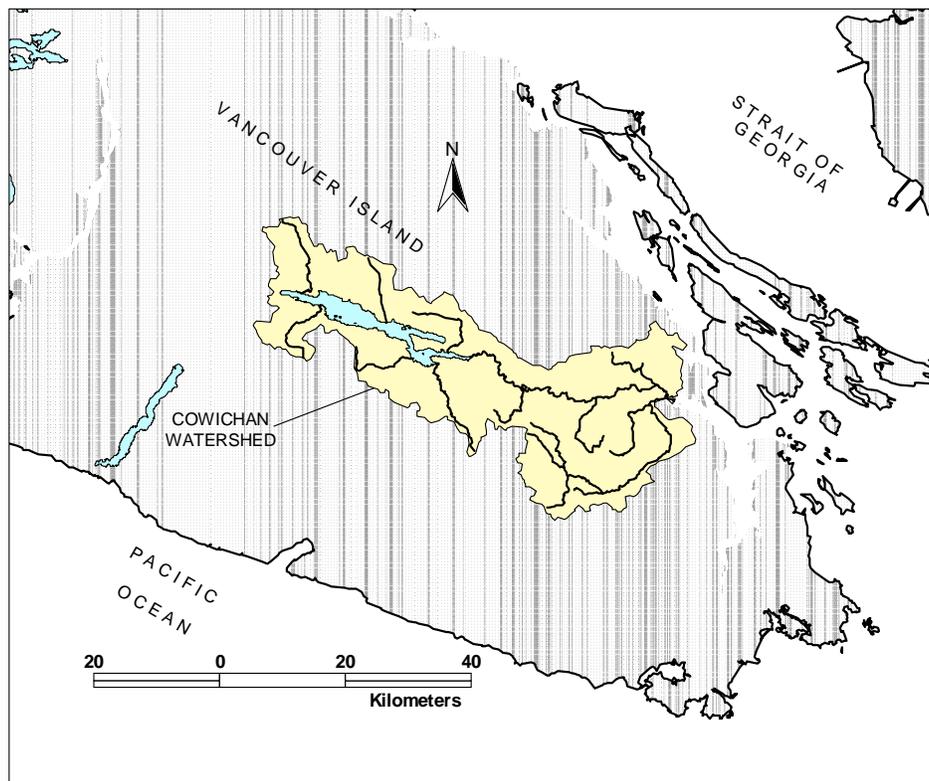


Figure 1. Location of the Cowichan Lake watershed relative to Southern Vancouver Island.

## **Appendices**

- Appendix I. Draft Report on the Status of Upper and Lower Georgia Strait Chinook Salmon. Prepared by Dick Nagtegaal, SCA Stock Assessment, with updates by Ron Deweirt, July 2005. Electronic file name is "Strait of Georgia draft August 3.doc".
- Note: This report is still in preparation. Although, it was anticipated that this report would be completed by August 1<sup>st</sup>, 2005, further work is required in addition to the Deweirt contract. Additional Fisheries and Oceans resources have been allocated to ensure the completion of this report by fall of 2005. The draft report has been submitted with this Final Endowment Funding report. A published report copy will be forward to the Endowment Committee in the fall of 2005.
- Appendix II. Power point presentation to the stakeholder steering committee regarding terminal harvest allocation, July 2005, Title "Cowichan River – Decision Guidelines for Salmon Harvest Management ". Prepared by G. Pestal, Solv Consulting Ltd. Electronic file name is "CowCk\_PresA\_Draft3.pps".
- Appendix III. Annual Data Summary Sheet for distribution to the Cowichan River harvest stakeholder steering committee, fishery managers, and government representatives. Prepared by G. Pestal, Solv Consulting. Electronic file name is "InfoSheet(Draft4).pdf".
- Appendix IV. Cowican River Data Summary Excel File – assembly of available stock and habitat data. Electronic file name is "CowR\_TFA\_28Jul05.xls".
- Appendix V. Report on Cowichan River Coho Analysis. Prepared by J.A. Taylor & Associates Ltd. Electronic file name is "Cowichan letter.pdf".
- Appendix VI. Report and Raw Data on Cowican River Coho Creel Survey. Electronic file names are "Cowichan River Creel Survey Results.doc", and "Coho creel survey 2004 raw data.xls".  
Note: This data is preliminary and is not for distribution.

## **Electronic Files Provided**

Cover Letter SP3-A020.doc  
SP3 (A-020) Cowichan Final Report.doc  
CowCk\_PresA\_Draft3.pps  
InfoSheet(Draft4).pdf  
CowR\_TFA\_28Jul05.xls  
Cowichan letter.pdf (Coho Analysis Report)  
Cowichan River Creel Survey Results.doc  
Coho creel survey 2004 raw data.xls  
Strait of Georgia draft August 3.doc

**Appendix I.** Draft Report on the Status of Upper and Lower Georgia Strait Chinook Salmon (*Oncorhynchus tshawytscha*) Stocks. Prepared by Dick Nagtegaal, SCA Stock Assessment, with updates by Ron Deweirt, July 2005.

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The front and back of a sample creel survey card shown below:





### FRESHWATER SPORT FISHING DAILY LOG

Return card into Drop Box after you have completed your fishing trip.  
 Thank you for your cooperation and have a great fishing trip!  
 (Use pencil only)

**Required Information:**

Date ( DD/MM/YY ): 03/11/04

Fishing START time: 7 AM

Fishing END Time: 9 AM

**YOUR HELP  
IS  
GREATLY  
APPRECIATED !**

For information phone: (250) 756-7032  
 Fisheries and Oceans Canada  
 3225 Stephenson Pt. Rd.  
 Nanaimo, BC, V9T 1K3

**USE 1 ROW PER FISH (KEPT or RELEASED)**

FISH NO.	TIME SPENT IN AREA (Hrs)	LOCATION (local name)	SPECIES NAME OR CODE (PUT Ø FOR ZERO CATCH)	KEPT? (circle)	Adult or Jack? (circle)	Salmon Only
						ADIPOSE FIN CLIPPED? (circle)
1	2 HRS	Liverbottom	COHO	<input checked="" type="radio"/> Y <input type="radio"/> N	<input checked="" type="radio"/> A <input type="radio"/> J	Y <input checked="" type="radio"/> N
2	"	"	"	<input type="radio"/> Y <input checked="" type="radio"/> N	<input checked="" type="radio"/> A <input type="radio"/> J	Y <input checked="" type="radio"/> N
3	"	"	"	<input type="radio"/> Y <input checked="" type="radio"/> N	<input checked="" type="radio"/> A <input type="radio"/> J	Y <input checked="" type="radio"/> N
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11				<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> A <input type="radio"/> J	Y <input type="radio"/> N
12				<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> A <input type="radio"/> J	Y <input type="radio"/> N
13				<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> A <input type="radio"/> J	Y <input type="radio"/> N
14				<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> A <input type="radio"/> J	Y <input type="radio"/> N

More than 14 fish kept \_\_\_\_\_ or released \_\_\_\_\_ ?

What was your total catch for the day 4 ? - zero catch is important information!

