

Area 4 Chum Enumeration Plan Evaluation

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ABSTRACT

Skeena chum are a stock of concern and understanding trends in spawning abundance play an integral role in chum assessments. This project was an evaluation of the Skeena chum escapement survey plan against the requirement to provide representative indices of spawner abundance. The previous core stock assessment chum spawner enumeration plan (English et al 2006) was reviewed and updated.. The recommended surveys were completed in 2009 by experienced DFO or First Nations staff. This review makes recommendations on continuing the program with some minor changes.

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INTRODUCTION

Funding for this project was provided by the Moore Foundation through the Pacific Salmon Foundation as part of funding for the Skeena Watershed Initiative. A copy of the proposal is included in Appendix 1.

Skeena chum are a stock of concern and understanding trends in spawning abundance play an integral role in chum assessments. The Skeena test fishery provides an aggregate index of abundance for chum stocks migrating above the test fishery site. The Kitwanga weir operated by the Gitanyow Fisheries Program provides an accurate enumeration for Kitwanga chum stock. All other chum enumerations in the Skeena are conducted by foot, boat or aerial surveys and at best represent an index of abundance.

The objective of this project is to evaluate the options for chum escapement surveys that meet the criterion of providing representative indices of spawner abundance, and then conduct the recommended ground or aerial enumerations using experienced DFO or First Nations staff. This report presents the results of these additional surveys and an evaluation of their utility as indicators of chum escapement. There will be a further review and evaluation of the results of this project with First Nation technical committees as part of the 2010 enumeration plan development.

METHODS

Historical Skeena Chum Escapement Records

Spilsted and Spencer (2009) provide a detailed review of the DFO escapement data holdings for DFO statistical areas 1 through 6 including the Skeena River chum. A description of the type, format, scope and content of these data holdings, as well as information on the procedure for accessing these data are provided in their report. Paper records documenting annual salmon spawning ground assessments in the North Coast, commonly known as BC16 files, may in some cases extend back to the early 1920's. Additional research is underway to review archival escapement records for additional records prior to 1950. This project will be completed by June 2010 and any additional records will be incorporated into the database. Electronic scanned images of these files for all years up to 2003 are part of North Coast Stock Assessment Unit data holdings. Electronic spreadsheet data tables summarizing annual escapement estimates noted on BC16 reports are organized by Statistical Area, by Management Subarea, by species, by stream and by year. These data are available for all years of existing records to present (contact Brian Spilsted -brian.spilsted@dfo-mpo.gc.ca). In the Skeena watershed, these escapement databases represent a joint effort in the collection and reporting between First Nations and DFO.

Initial Core Stock Assessment Plan

The World Summit on Salmon held in Vancouver in June 2003 identified a number of concerns regarding the future of Canada's stock assessment programs for Pacific salmon. These concerns prompted a workshop in November 2003 where stock assessment experts from the Department of Fisheries and Oceans, Canada (DFO), universities, the BC government, private sector and

non-government organizations (NGO's) formulated recommendations related to defining a core stock assessment program (CSAP) for salmon.

Funding for this project was provided by the Pacific Salmon Foundation, Pacific Salmon Endowment Fund Society, DFO, and Ecotrust. The project was lead by LGL Limited under contract to the Pacific Salmon Foundation and a *Core Stock Assessment Plan* (CSAP) was completed (English et al 2006).

The historical escapement data provided essential material for the CSAP development. On the Skeena the plan development was a joint effort of First Nations technical representatives and DFO staff with first hand knowledge of the escapement surveys. The CSAP provided a recommended approach for escapement monitoring for Skeena chum. Information taken into consideration when selecting streams included:

- average number of spawners;
- number of years with escapement estimates from 1980-03;
- the quality of historical escapement estimates;
- stream accessibility and local capacity for escapement monitoring;
- recommended enumeration method (i.e. fence, mark-recapture, visual surveys, etc.);
- details for visual surveys, included: survey methods, the number of surveys,
- annual cost estimate for escapement monitoring.

The CSAP chum enumeration plan was reviewed June 4, 2009 during a Skeena Fisheries Commission technical committee meeting. The plan was updated based on the above criteria and candidate streams selected for pilot surveys in 2009.

The recommended aerial, boat or foot surveys were conducted by DFO and First Nation staff normally involved in escapement enumerations. Documentation and recording methods followed the regular protocols. In many cases, maps were produced showing the specific spawner location for each survey

RESULTS

The following recommendation was provided from the 2006 core stock assessment report (English et al, 2006):

Of the 47 chum stocks in the escapement record for Area 4 it is proposed that Kitwanga continue to be monitored with a fence and annual visual surveys be conducted for 10 streams (Andesite, Dog-tag, Date, Ecstall, Gitnadoix, Kasiks, Kispiox, Kleanza, Silver and Skeena River-West); accounting for 23% of the streams and 85% of the historical escapement since 1980. The most commonly recommended enumeration method was ground surveys but helicopter surveys were recommended for the Ecstall River and Kispiox. The Kispiox surveys are opportunistic counts obtained during Chinook surveys.

2009 Planning review

The June 4th 2009 technical committee agreed that the previously recommended surveys remained the best candidates, but recommended the addition of Fiddler Creek to the list (Table 1). In additional the methods were revised to include more helicopter surveys as the

recommended survey method. Helicopter surveys were added for Date, Dog Tag, Gitnadoix, Kasiks and Skeena River-West.

Survey Results

An Excel spreadsheet providing details of the surveys conducted as part of this project is available from the first author or from the Pacific Salmon Foundation website. This sheet includes electronic links to each map and individual stream inspection log generated from the study.

The Area 4 chum escapement database that has been updated through 2009 and includes all pre 1950 records is also available from the author or from the Pacific Salmon Foundation. This excel file includes separate worksheets for reports (summarized by decade and subarea), pull down boxes to generate graphs of historical annual chum escapements for any stream or subarea, as well as the “raw data” in database format.

Andesite surveys were completed with 4 walks by DFO staff resulting in an escapement estimate of 107. Conditions in this system allow for reliable indices of abundance.

Dog Tag Creek surveys were completed with 4 helicopter flights by DFO staff resulting in an escapement estimate of 120. The surveyors noted that viewing conditions on this Creek had deteriorated in recent years as a result of further braiding of the creek and deciduous tree growth. Conditions in this system dictate estimates of low reliability. This may be improved by using the boat/walk method for further surveys.

Date Creek surveys were completed with 4 boat surveys by Skeena Fisheries Committee (SFC) staff as part of chum DNA collection activities. There were 71 samples collected but further discussion and advice from the SFC surveyors is required to provide an estimate of spawners. This survey was conducted on the Date Creek fan at the confluence with the Kispiox River and conditions at this site allow for reliable indices of abundance.

Kasiks River surveys were completed with 5 helicopter flights by SFC and DFO staff resulting in an escapement estimate of 120. The SFC surveys noted the presence of chum spawners earlier than traditional survey times. DFO surveyors noted absence of spawners in some normal spawning areas. The 2010 plan will include a review of the locations of the reported early spawners and the “former” spawning areas. A more detailed map will be provided for 2010 surveyors. This program may also benefit from adopting the boat/walk survey method. In general the index is of lower reliability because of the difficult and changing viewing conditions.

The Fiddler surveys were completed with a spawner estimate of 25 (details to follow).

Kispiox River surveys were completed with 7 walking surveys by SFC staff resulting in an escapement estimate of 150. Further discussion with the SFC surveyors is required to get advice on the best approach to provide consistent survey index.

Kleanza Creek surveys were completed with 4 walks by DFO staff resulting in an escapement estimate of 16. Conditions in this system allow for reliable indices of abundance.

Gitnadoix River surveys were completed with 4 helicopter flights by DFO staff resulting in an escapement estimate of 100. Surveyors noted the chum spawn in a particular location and the surveys provide a good index of the spawners in this specific area. Recommend further surveys by boat/walk method.

Skeena River-West (lower mainstem channels) surveys were completed with 1 helicopter flight by DFO staff. No escapement estimate was produced from the one flight, although 96 chum were observed. Further discussion is required, but the initial feedback is this area has such highly variable visibility that the indices are of little value.

Silver Creek surveys were not completed because of weather and lack of available survey staff.

Ecstall River surveys were not completed because of limitations on staff and helicopter availability. This is an important system that needs to be reevaluated.

DISCUSSION

After a review of the 2006 enumeration plan, the only change in the list of recommended streams to survey was the addition of Fiddler Creek. Helicopter surveys were recommended for Date, Skeena River-West, Gitnadoix, Dog Tag and Kasiks rather than the previously recommended boat/walk methods.

The 2009 results support the continuation of surveys for all except Skeena River-West where further review is required to evaluate whether the survey numbers represent an index of spawner abundance. It is recommended that the Date, Gitnadoix, Dog Tag and Kasiks surveys revert back to the boat/walk method. This will maintain or improve the indices while reducing the on-going costs. The Kasiks system requires further review of survey timing, and documentation of historic spawning areas to make the surveys more effective. The Ecstall survey was not completed in 2009. This is the largest Skeena chum system and needs to be a priority for DFO enumeration. Silver Creek also needs to be surveyed as an index of the severely depressed estuary chum systems.

These results will again be reviewed through DFO –FN technical committees as part of the development of the 2010 enumeration plan. The program would benefit from further review and participation through Tsimshian technical processes.

REFERENCES

English, K.K., Peacock, D., and Spilsted, B. 2006. North and central coast core stock assessment program for salmon. Prepared for Pacific Salmon Foundation and Fisheries and Oceans Canada by LGL Limited Environmental Research Associates and Fisheries and Oceans Canada.

Spilsted, B., and Spencer, B. 2009. Documentation of North Coast (Statistical Areas 1 to 6) salmon escapement information. Can. Manusc. Rep. Fish. Aquat. Sci. 2802: vi + 66 p.

TABLES**Table 1.** Skeena Chum Enumeration Recommendations 2009

SUBAREA	STREAM NAME	Enum Method 2006	Enum. Method 2009
COASTAL	ECSTALL RIVER	Helicopter	Helicopter
COASTAL	SILVER CREEK	Boat/Walk	Boat/Walk
LOWER SKEENA	DOG-TAG CREEK (Gitnadoix trib.)	Boat/Walk	Boat/Walk or Helicopter
LOWER SKEENA	GITNADOIX RIVER	Boat/Walk	Helicopter
LOWER SKEENA	ANDESITE CREEK	Walk	Walk
LOWER SKEENA	KASIKS RIVER	Boat/Walk	Helicopter
LOWER SKEENA	SKEENA RIVER - WEST	Boat/Walk	Helicopter
MIDDLE SKEENA	KITWANGA RIVER	Fence	Fence
MIDDLE SKEENA	KLEANZA CREEK	Walk	Walk
MIDDLE SKEENA	FIDDLER CREEK		Walk
KISPIOX	DATE CREEK	Walk	Walk/Helicopter
KISPIOX	KISPIOX RIVER	Helicopter	Helicopter

FIGURES

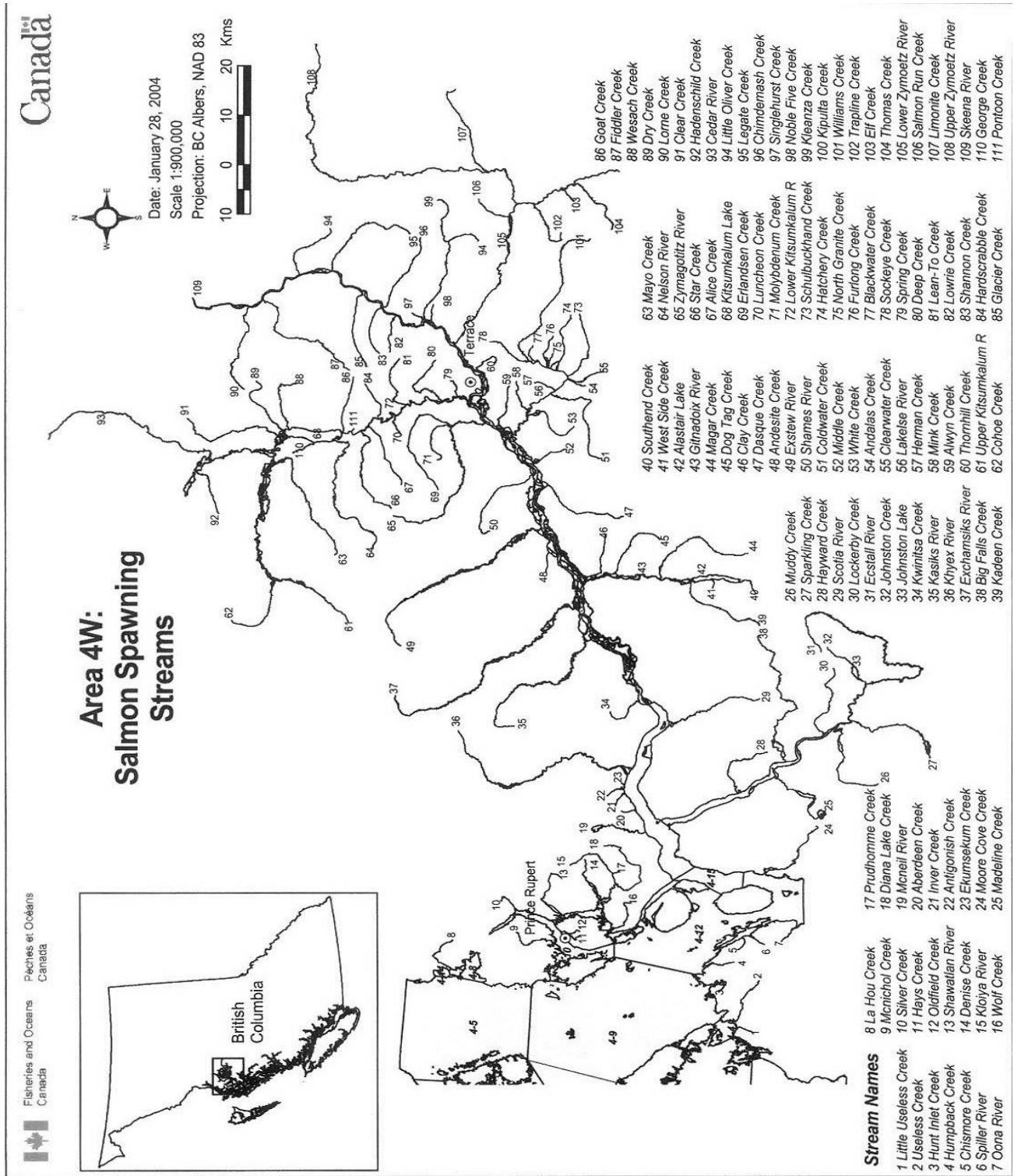


Figure 1. Skeena River Salmon spawning stream location.

APPENDICES

Appendix 1. Project proposal for the Area 4 Chum Enumeration Plan Evaluation

Questions Addressed:

What are the options and the priorities for Skeena chum escapement enumeration?

The objective is to evaluate the options for quality chum escapement enumerations, and conduct pilot enumerations with the intent to establish (or re-establish) chum escapement indices that can be used to evaluate the stock status of Skeena chum and form the basis for an on-going monitoring program.

Methodology:

Project lead will be Brian Spilsted DFO pink and chum biologist in Prince Rupert.

The program will review and document all past chum escapement surveys in the Skeena Area (Stat Area 4) and update the core stock assessment escapement priorities. (A discussion was held June 4th as part of the SFC technical meeting to update the chum enumeration plan and select candidate streams for pilot surveys in 2009). These streams were used as the basis for the cost proposal that is attached.

Additional interviews will be conducted with DFO staff or others that conducted surveys in previous decades, the information will be recorded on maps and used to assist in planning the 2009 surveys.

DFO and FN staff will be responsible for conducting the surveys and recording the survey data.

Expected Outputs:

Surveys conducted in 2009 will all be documented through the individual Stream Inspection Log (SIL) database, as well as through addition photo or mapping documentation. Escapement estimates will be included in the "BC16" escapement database.

A report will be prepared covering all aspects of the program, including an evaluation of the utility of the surveys and recommendation for future applications.

Budget:

35 K total budget reflecting a 20 K reduction from the original 55 k because the tagging component was dropped. The lower river Steelhead tagging project did not proceed. The chum tagging component depended on using the receivers from the steelhead project for recovery information.

The project includes an in kind contribution of 15.4 K from DFO.

The PSF contribution total of 35 K covers 8.8 K for technician time to research and document past survey details, conduct the 2009 surveys and contribute to the reporting, as well as 26.3 K for helicopter time.