

Fraser Salmon & Watersheds Program



2009/10 FINAL REPORT

FSWP File Number*	07350-35/FSWP 09 LR HWRS 97
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* Please use the FSWP File Number provided in previous FSWP project correspondence.

1. Project Information

1.1. Project Title

Evaluating the vulnerability of Pacific salmon to effects of climate change in the Central Interior and identifying regional adaptation strategies

1.2. Proponent's Legal Name

ESSA Technologies Ltd.

1.3. Project Location

The study area (Cariboo-Chilcotin) is delineated by tributaries to the Fraser River between (and excluding) the confluence with the Thompson and Nechako Rivers. This project is an office exercise.

1.4. Contact for this report

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1.5 Funding Amount

Original Approved Grant Amount:	Total FSWP Expenditures:	Final Invoice Amount:	Final Non-FSWP leveraging, including cash and in-kind:
\$44,997.50	\$44,997.50	\$22,498.75	\$3,700

2. Project Summary

Please provide a single paragraph describing your project, its objectives, and the results. As this summary may be used in program communications, clearly state the issue(s) that were addressed and avoid overly technical descriptions. Maximum 300 words.

Across salmon watersheds in British Columbia we can expect a variety of adverse effects of climate change (increases in water temperature, reductions in summer low flows, etc). Currently, we have a broad scale understanding of future climate conditions (i.e., changes in air temperature and precipitation), yet lack the tools to translate this information into changes at the watershed scale. Moreover, we lack approaches for combining this information with existing land and water use data to help planners and managers develop strategies that will help human communities, salmon, and watersheds cope with future changes. Credible information about vulnerability and adaptation is critical so we know where to act, when to act, and how significantly to act, and thereby avoid wasting precious time, money, and human resources.

This project's aim was to advance modeling of watershed vulnerability to climate change (via stream temperature and flow) and supplement this information with analyses of existing land and water use data to identify adaptation opportunities for regional planning and decision making. These efforts were successful at improving the credibility of vulnerability modeling and developing a pilot approach for

identifying regional adaptation strategies. In particular, the project established:

(1) a strong technical foundation from which to understand vulnerability of salmon watersheds and identify opportunities for adaptation across the region; and

(2) linkages to local collaborators / users who are hungry for credible climate change information to improve current management and use it as a catalyst enhance the profile of aquatic resources in regional planning.

OPTIONAL Please give a short statement (up to 100 words) of the most compelling activity or outcome from your project.

3. Final Project Results and Effectiveness

3.1 Copy EXPECTED OUTCOMES from your detailed proposal and insert into this section. Add additional rows as needed. Then please list the FINAL OUTCOMES (the tangible end products resulting from this work) associated with expected outcome.

If FINAL OUTCOMES differ from the original EXPECTED OUTCOMES please describe why, and the implications for the project.

EXPECTED OUTCOMES	FINAL OUTCOMES
1. Provide an opportunity for regional and provincial managers to identify adaptation opportunities given anticipated alterations to freshwater environments due to climate change.	<u>Final outcome consistent with what was expected.</u> Deployed survey to working group, engaged these individuals in one-on-one discussions, and hosted a 1-day technical meeting to present, validate, and receive feedback on vulnerability and adaptation information.
2. Tailor results from previous vulnerability assessment to the needs of regional and provincial decision makers.	<u>Final outcome consistent with what was expected.</u> Updated previous vulnerability modeling (stream temperature and flow) to better reflect needs of regional and provincial decision makers.
3. Prepare a climate change adaptation plan that outlines appropriate management strategies for freshwater habitats in the Cariboo-Chilcotin.	<u>Final outcome slightly less than what was expected.</u> Technical report and description of adaptation strategies was not as specific as hoped (in space, time, or range of strategies). Adaptation planning included identifying feasible strategies and completing analyses for a subset of strategies across the region. This outcome does not affect the success of the project, especially considering the feedback from local audiences that there is a need to develop credible vulnerability information and a need to consult more broadly (than occurred with this project) to identify feasible adaptation strategies. This outcome was a lesson learned which will enhance success of future stages of work.

3.2 Please evaluate the EFFECTIVENESS of your project in achieving Project Objectives. Please identify the indicators you have used to measure the effectiveness of your project. Please include any notable successes or challenges.

We believe this project was effective in terms of its technical advances, the level of engagement in current efforts, and amount of support for future development. The technical advances were effective because the methods relied upon models maintained by ESSA Technologies and Pacific Climate Impacts Consortium whose core development was funded outside this project. Without these other investments, this project would not have evolved to the same extent. Also, the information used to identify adaptation opportunities was drawn directly from available data in the Land and Resource Data Warehouse. From an engagement point of view, there was a high level of interest in being involved among all key resource management agencies in the region. However, due to scheduling conflicts and constraints in staffing, it was a challenge to engage as many individuals as we had hoped. The hope is to engage a larger number of individuals and agencies now that the technical methods have been advanced. Given the level of interest and invitations to present this work to others, we believe the project was effective in building support for stages of work.

3.3 REQUIRED: attach all DOCUMENTATION of Final Outcomes, and LIST attachments here. These may include technical reports, maps, photos, evidence of communications, lists of meeting participants, etc.

(1) Survey deployed to regional and provincial managers to understand adaptation priorities and needs for tailoring information to decision makers. Survey included as appendix in technical report (see #3 below).

(2) Technical meeting at Government Resources Building in Williams Lake, March 23, 2010 to present vulnerability modeling and analysis of adaptation opportunities. Attended by individuals from provincial, federal, First Nations, and independent local organizations. Agenda, overview presentation, and list of attendees included as appendices in technical report (see #3 below).

(3) Technical report describing vulnerability modeling and analysis of adaptation opportunities.
Filename: Vulnerability&AdaptationReport_100331.pdf

(4) GIS shapefiles and data tables summarizing vulnerability modeling and analyses of adaptation.
Filename: Vulnerability&AdaptationShapefiles_100331.zip

3.4 Please describe how the benefits of this project will be sustained and/or be built upon into the future. What are the planned next steps, or recommendations for further work, if applicable?

Beyond the life of this project, ESSA plans to present this work to a mix of audiences to facilitate further development and uptake of the work. Audiences who have an interest in seeing a presentation include:

- Cariboo-Chilcotin resource management committee in Williams Lake (i.e., heads of provincial agencies in region)
- Fisheries and Oceans Canada staff in Kamloops
- provincial agency staff in Victoria (Ministry of Forests, MOE water, ecosystems, and climate group)
- Northern Shuswap First Nations leaders in Williams Lake

We also hope to present this work to staff responsible for implementing Strategy 3 of the Wild Salmon Policy (which includes consideration of climate change) and if there's interest to present this work to Fraser Basin Council and Natural Resources Canada given linkages of this work to the Regional Adaptation Collaborative (RAC) program. We also have a meeting scheduled with the Pacific Climate Impacts Consortium to identify strategies for technical collaborations on future proposals. The hope is that these actions will garner the interest and financial support to advance this work to the next level.

3.5 What are the top three lessons learned from this project that could be useful to communicate to others doing similar work in the Basin?

1. Do not wait for provincial or federal agencies to directly fund regional climate change studies. Given the current economic climate and constraints on provincial and federal budgets, it is unrealistic that these levels of government will fund regional climate studies in the near future. However, our observation is that there is a strong appetite for this information among local users and a gap in the ability of available tools to provide it. Given time lags and resources needed to develop this information, we recommend being proactive to advance the state of information so planners and decision makers are better able to act as adaptation opportunities emerge in the future. Also, efforts such as this can act as a catalyst for further action by government (by illustrating vulnerabilities more clearly and highlighting the need to adapt).

2. Identify a lead local agency to advance discussions about adaptation. There are some advantages to developing the technical basis for vulnerability prior to broader consultation on adaptation. However, discussions about adaptation have implications on many stakeholders and will likely require complex tradeoffs among competing interests for land, water, and fish. For this reason, as discussions about adaptation evolve it will be increasingly important to have a provincial, federal, or First Nations agency act as the lead to bring different interests together. Given current government priorities and resources, these organizations are limited in their ability to act in this way today.

3. Develop a strong technical foundation as a basis for consultation on adaptation. Given the implications of climate change mitigation and adaptation on natural resources and human communities, planner and managers see this issue as a priority. However, for them to act there is a need to have a strong technical understanding of vulnerabilities that is free from any perception of bias. These technical pieces need to be in place first, prior to consultation on adaptation.