Marc A. Nelitz

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Post-Secondary Education

- Master of Resource Management, Simon Fraser University, 2001–2004
- Bachelor of Science, Ecology and Environmental Biology, University of British Columbia, 1992–1996

Professional Associations / Training

- Registered Professional Biologist (RPBio) with the British Columbia College of Applied Biology
- Completed the Canadian Environmental Leadership Program (CELP) with the Hollyhock Leadership Institute (by referral only)

Professional Overview

- Position: Joined ESSA in 2004; working as a Systems Ecologist with the Environmental Management team, focusing in four domains: (1) Regulatory and Policy Implementation, (2) Vulnerability and Adaptation (especially climate change), (3) Adaptive Environmental Assessment and Management, and (4) State of Environment Reporting.
- General interests: Bridging the gaps among science, decision making, and policy by: (1) improving communication of technical information to non-technical audiences, (2) applying creative solutions to multidisciplinary environmental problems, and (3) developing rigorous and innovative frameworks that strengthen the role of science in strategic-level decision making.
- Technical skills: Environmental management (policy implementation, management frameworks, environmental indicators and performance reporting, adaptive management), structured decision making (multi-attribute trade-off evaluations, PrOACT, discrete choice experiments, analytic hierarchy process), computer modelling (deterministic and stochastic simulations, geographic information systems), statistical analysis (classical and Bayesian), and environmental assessments (conceptual modelling of impact hypotheses, weight-of-evidence approaches).
- Research and communication: Comprehensive literature reviews and summaries, expert interviews and formal surveys, technical writing (indicator reporting, research summaries, peer reviewed articles), workshop facilitation, and presentations of complex science topics to technical and non-technical audiences.
- Field experience: Environmental monitoring, fish and wildlife inventories, and impact assessments.
- Software skills: (1) statistical analysis using JMP and R; (2) simulation modeling using Excel with advanced applications using Visual Basic for Applications (VBA); (3) design and development of relational databases using Access; (4) document preparation and presentation using Word and PowerPoint; (5) spatial analyses and mapping using ArcMap 9.2.

Past Clients and Project Collaborators

- BC Ministry of Environment
- BC Hydro
- Burrard Inlet Environmental Action Program
- Canadian Columbia River Inter-tribal Fisheries Commission
- Canadian Wildlife Service
- Commission of inquiry into the decline of sockeye salmon in the Fraser River (Cohen Commission)
- David Suzuki Foundation
- Environment Canada
- Fisheries and Oceans Canada
- Hul'qumi'num Treaty Group
- Indian and Northern Affairs Canada
- International Institute for Sustainable Development
- Nature Conservancy Canada
- Pacific Climate Impacts Consortium
- Pacific Fisheries Resource Conservation Council
- Simon Fraser University
- The Nature Conservancy
- The Pembina Institute
- University of British Columbia

- Fraser Salmon and Watersheds Program
- Yukon Environmental and Socio-Economic Assessment Board

Select Project Descriptions

REGULATORY AND POLICY IMPLEMENTATION

Fraser freshwater ecology and status of sockeye Conservation Units – *Commission of inquiry into the decline of sockeye salmon in the Fraser River (Cohen Commission)*, 2010-present: Core researcher among a team of scientists to evaluate the contribution of freshwater stressors (e.g., forestry, mining, agriculture, urbanization, hydro-electricity) to recent declines in Fraser River sockeye salmon. Assignment involved analyzing existing and new evidence to evaluate the hypothesis that freshwater stressors have contributed to the decline of sockeye salmon since the late 1990s and in particular the poor returns in 2009.

Technical support for engagement on Water Act Modernization – *The Pembina Institute*, 2010: Conducted research to describe the nature and magnitude of impacts on water quantity and water quality of oil and gas in Northeastern British Columbia. This research was then used to help Pembina identify policy recommendations that could be submitted to the BC Ministry of Environment as part of Water Act Modernization and implementation of the provincial Living Water Smart policy.

Developing a risk management framework for the incidental take of migratory birds in Canada – *Environment Canada*, 2008-2010: Working with government, academics, industry, and other stakeholders to develop a permitting system to manage incidental take of migratory birds as required under Canada's Migratory Bird Convention Act. The resulting permitting framework will be used as a system to help Environment Canada managers assess the effects of an activity across many development sectors in Canada and then recommend permit conditions that are commensurate with the assessed effects.

Evaluation of the Wild Salmon Ecosystem Initiative – *Moore Foundation*, 2009: Worked with an international team of economists and scientists to conduct an evaluation of the Moore Foundation's Wild Salmon Ecosystem Initiative (WSEI). The program has invested millions of dollars in grants to support scientific research, on-the-ground conservation, and advocacy to enhance the protection of wild Pacific salmon across the North Pacific (i.e., British Columbia, Alaska, and Russia). Research activities included conducting field interviews with grantee across western North America and summarizing findings to present to Moore's Board of Directors.

Identifying policy options for effective implementation of Living Water Smart – *Pacific Fisheries Resource Conservation Council*, 2008-2009: Worked with water policy academics and other water experts to investigate water legislation and water management case studies from other jurisdictions around the world. The goal of the work was to learn about successes and failures in these other jurisdictions as related to water governance and management for the benefit of instream values and fish resources. Lessons learned were then used to develop recommendations to provincial and federal governments on how to effectively implement the Living Water Smart policy, whose purpose is to help resolve current and future water use conflicts.

Integrated Planning and the Wild Salmon Policy in British Columbia – *David Suzuki Foundation*, 2007-2008. Worked with the David Suzuki Foundation and Fisheries and Oceans Canada to: (1) review the status of policy implementation, (2) identify challenges and opportunities related to implementing the policy, and (3) develop recommendations that would benefit DFO's implementation of the Wild Salmon Policy.

Developing a framework for designating Temperature Sensitive Streams in British Columbia – *BC Ministry of Environment*, 2006-2008: Partnered with the BC Ministry of Environment, Fisheries and Oceans Canada, and University of British Columbia to develop a decision-making framework for designating "Temperature Sensitive Streams" as required under section 15 of B.C.'s Government Actions Regulations. The project used a workshop and collaborative engagement of technical experts to develop relevant watershed and fish community indicators, which were used to identify streams with having a high likelihood of thermal changes due to forestry activities and a high likelihood of changes in fish communities due to those heating effects.

Evaluation of the Watershed Evaluation Tool and implementation of a process for designating Fisheries Sensitive Watersheds in British Columbia – *BC Ministry of Environment*, 2005-2008: Conducted a quantitative

evaluation of the provincial government's Watershed Evaluation Tool. This tool integrates indicators of watershed sensitivity and fish sensitivity to designate "Fisheries Sensitive Watersheds" as specified under Section 14 of B.C.'s Government Actions Regulations. The purpose of this evaluation was to evaluate the effect of underlying model structure and assumptions (i.e., model uncertainties) on watershed designations and identify designations that are robust to uncertainties.

Implementing a collaborative approach to quantifying environmental flows for the Sacramento River, California – *The Nature Conservancy*, 2005-2006: Developed a decision analysis tool to evaluate the ecological consequences of alternative flow management scenarios on the Sacramento River, California. Scenarios were evaluated in terms of their effects on and tradeoffs among riparian habitat features, river channel condition, and freshwater biota. Ecological and physical indicators are being drawn from available models

ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT

Technical review of potential impacts of Yukon Queen II operations on salmon – *Yukon Environmental and Socio-Economic Assessment Board*, 2008: Performed an independent review of studies to assess the potential impacts of catamaran operations on salmon within the upper Yukon River. In particular, work provided opinion statements about a variety of impact pathways related to catamaran operations, and applied more scientifically rigourous methods to develop more defensible mitigation strategies for catamaran operations.

Review of Adaptive Management Plans for Diavik and Ekati diamond mines in the Northwest Territories – *Fisheries and Oceans Canada and Indian and Northern Affairs Canada*, 2008: Performed an independent review of proposed Adaptive Management Plans for two diamond mines in the Northwest Territories. Work involved providing a critical review of these plans, recommendations for improvements, and a presentation of findings to the local Environmental Monitoring and Assessment Board.

Evaluating the potential risk of change in water quality in the Coquitlam Reservoir from re-introduction of sockeye salmon – *BC Hydro's Bridge Coastal Restoration Program*, 2006-2007: Worked as part of a collaborative team to (1) identify the pathways of potential effects of sockeye salmon on water quality in the Coquitlam Reservoir, and (2) evaluate the potential risks associated with these pathways of effects.

Assessing the feasibility of restoring anadromous salmon into the Canadian reaches of the Upper Columbia River – *Canadian Columbia River Inter-tribal Fisheries Commission*, 2006-2007: Developed a scoping document to detail the feasibility, impacts, and benefits of restoring Pacific salmon to the Canadian portion of the upper Columbia River beyond Chief Joseph and Grand Coulee dams (one of the world's tallest dam structures). Our research considered a broad range of issues across economic, social, and environmental objectives. This project also involved co-facilitating a workshop with First Nations participants and technical experts to review high priority issues and elicit feedback on the feasibility of restoring salmon passage.

Technical review of the Vancouver Island Transmission Reinforcement project - *Hul'qumi'num Treaty Group*, 2006-2007: Provided a technical review of the Environmental Application for a high voltage transmission line and its related impacts on the marine environment. The review focused on determining the accuracy, completeness, and relevance of the Environmental Assessment and proposed mitigation / compensation activities. Recommendations to improve the project were also provided.

Technical review of Deltaport third berth project fish habitat compensation plan – *Hul'qumi'num Treaty Group* 2006: Provided a technical review of the Fish Habitat Compensation Plan and supporting technical documents to ensure consistency with current federal standards and scientific approaches in compensation of impacts on the marine environment.

Review of experimental design principles for projects to restore AYK salmon – *Arctic-Yukon-Kuskokwim (AYK) Sustainable Salmon Initiative*, 2005: Co-authored a report to improve application of experimental design principles (i.e., adaptive management) to monitoring of various types of restoration activities (e.g., changes in fisheries management practices, restoration of freshwater habitat, artificial enhancement) for Pacific salmon in the AYK region of Alaska.

VULNERABILITY AND ADAPTATION

Evaluating the vulnerability of Pacific salmon to climate change in the Cariboo Chilcotin and identifying regional adaptation strategies – *Fraser Salmon and Watersheds Program*, 2008-2010: Used climate change predictions under different future scenarios to assess the vulnerability of Pacific salmon to climate change within the Central Interior of British Columbia. This work quantitatively linked climate variables (predictions of air temperature and precipitation) to stream conditions (water flow and temperature) to understand potential changes in fish populations. Working collaboratively with local stakeholders and a technical working group, results of the vulnerability assessment were linked to regional decision making processes to develop adaptation strategies.

Helping Pacific salmon survive the impact of climate change on freshwater habitats – *Pacific Fisheries Resource Conservation Council*, 2006-2007: Prepared two synthesis reports for water and fisheries managers in B.C. One report summarized the engineering- and governance-oriented strategies that could be implemented to help salmon survive the anticipated impacts of climate change on freshwater habitats. The other report discussed the issue of climate change vulnerability and adaptation in the context of six case studies across British Columbia – the Okanagan, Quesnel, Nicola, Cowichan, Nass, and Englishman River watersheds.

Identifying the potential financial liability of environmental and social impacts for BC Hydro's Integrated Electricity Plan resource options – *BC Hydro*, 2005-2006: Assessed the environmental and social impacts associated with seven energy supply options (coal, geothermal, wind, biomass, natural gas, micro-hydro, and large-scale hydro) for the purposes of long-term electricity planning. Tasks required estimating the costs of compensating or mitigating impacts and understanding the current regulatory and legal requirements influencing them. Future regulatory scenarios were characterized in a probabilistic framework to quantify those impacts with a "reasonably foreseeable financial liability".

STATE OF ENVIRONMENT REPORTING

Ecosystem Status and Trends Report for Canada – *Environment Canada*, 2007-2008: Working collaboratively with Environment Canada, provincial environment agencies, International Institute of Sustainable Development, and regional experts to help develop an indicator and reporting framework for the Boreal Cordillera (i.e., northern British Columbia and southern Yukon). The intent of this project is to develop a report that informs the public as well as federal and provincial Environment Ministers about the status and trends of Canada's Ecosystems.

Developing environmental indicators for a State of Environment report of Burrard Inlet – *Burrard Inlet Environmental Action Program*, 2006-2007: This project engaged federal, provincial, and municipal agencies, as well as local industry partners to develop a State of Environment report for Burrard Inlet. This report will present information to decision makers and the public related to a broad range of environmental issues: air, water, land, and biodiversity. Tasks included reviewing available data sources, evaluating appropriateness, providing recommendations for SOE reporting, and calculating indicators.

Refining habitat indicators for Strategy 2 of the Wild Salmon Policy – *Fisheries and Oceans Canada*, 2007: Helped Fisheries and Oceans Canada develop indicators as part of Strategy 2 of the Wild Salmon Policy. This project involved reviewing data sources for indicators, holding a workshop to review indicators and data sources, as well as reviewing information to specify indicator metrics and benchmarks.

Reviewing environmental impact metrics to track BC Hydro's long-term environmental performance – *BC Hydro,* 2006: Reviewed various literature sources to evaluate the suitability of existing environmental impact metrics for use in BC Hydro's annual reporting of environmental performance. Recommendations were provided to help BC Hydro implement a transparent, credible, and scientifically rigorous reporting framework.

Managing Pacific salmon for ecosystem values: Ecosystem indicators and the Wild Salmon Policy – *Pacific Fisheries Resource Conservation Council,* 2005-2006: Reviewed the literature to summarize the "state of the science" and describe the role of spawning salmon in shaping aquatic and terrestrial ecosystems (e.g., wildlife populations, riparian plant communities, freshwater production). This report provides a basis from which to identify relevant and measurable ecosystem indicators for use in support of Strategy 3 of Fisheries and Oceans Canada's Wild Salmon Policy.

Selected Presentations

- **Nelitz, M.** 2010. Science and management of fish-forest interactions: Insights from stream and watershed designations in B.C. Invited guest speaker in FRST 386: Aquatic ecosystems and fish in forested watersheds. University of British Columbia, Department of Forest Sciences, Vancouver, B.C.
- **Reese-Hansen, L., and M. Nelitz.** 2010. Temperature-sensitive streams (TSS) and their designation under GAR/FRPA. Online presentation as part of the FORREX research chat series. Presentation available from: http://www.forrex.org/events/scienceforum/presentations/Reese-Hansen_22Feb10.pdf
- **Parkinson, E., M. Nelitz, and R.D. Moore.** 2009. Identifying 'Temperature Sensitive Streams' in the B.C. interior. Invited guest speaker to colloquium in University of British Columbia's geography department. Vancouver, B.C.
- **Nelitz, M., C. Murray, and K. Wieckowski.** 2009. Integration as a means of enabling Ecosystem Based Management: Insights from the Wild Salmon Policy. Oral presentation at the 4th Annual Applied Biology Conference. Victoria, B.C. Agenda of conference presentations available from: http://www.apbbc.bc.ca/files/CONFERENCE%20registration%20form%20feb%2018.pdf
- **Nelitz, M., E.A. MacIsaac, and R.M. Peterman.** 2007. Identifying "Temperature Sensitive Streams" for forest management in the northern interior of B.C. Poster presentation at Riparian Management in Headwater Catchments: Translating Science into Management. University of British Columbia, Vancouver, B.C.
- **Nelitz, M.** 2006. Insights and elements of decision analysis. Invited guest speaker in REM 625: Risk assessment and decision analysis. Simon Fraser University, School of Resource and Environmental Management, Burnaby, B.C.
- **Nelitz, M., C. Murray, M. Porter, and D. Marmorek.** 2006. Managing Pacific Salmon for ecosystem values: Ecosystem indicators and the Wild Salmon Policy. Invited oral presenter and panel participant at DFO Ecosystem Indicators Workshop, Vancouver, B.C.
- **Nelitz, M., E.A. MacIsaac, and R.M. Peterman.** 2004. Identifying "Temperature Sensitive Streams" for forest management: An analysis of stream temperature variation and salmonid thermal requirements in the central interior of B.C. Oral presentation to Canadian Conference for Fisheries Research, St. John's, NL.

Past Work Experience

2002–2004 **Research Assistant**, School of Resource and Environmental Management, Simon Fraser University, Burnaby, B.C.

- Designed field monitoring plans
- Developed large environmental databases and integrated existing information for statistical and GIS analyses
- Performed classical and Bayesian statistical analyses on fish-related research problems
- Programmed computer models to understand climate change effects on the marine environment and fish population forecasts
- Conducted detailed literature reviews and reported research results
- Reviewed and edited manuscripts for peer-reviewed publication

1998–2001 **Environmental Biologist**, ARC Environmental Ltd., Kamloops, B.C.

- Provided environmental monitoring, fish and wildlife inventories, and impact assessments of development activities in various sectors (forestry, energy, municipal development, agriculture)
- Conducted extensive literature reviews
- Communicated project results to government agency staff and local stakeholders
- Proofread project reports
- Developed and administered a training program for First Nations fisheries technicians
- Developed new project opportunities and managed projects

1999 **Wildlife Technician**, Applied Ecosystem Management, Hinton, AB

- Surveyed bird communities and habitat use in the Foothills Model Forest

1997 **Wildlife Technician**, Ministry of Forests, Kamloops, B.C.

- Sampled small mammal populations and habitats across southern B.C.

Past Peer Review

- FORREX Forum for Research and Extension in Natural Resources
- British Columbia Forest Science Program
- North American Journal of Fisheries Management
- Exxon Valdez Trustee Council

Volunteering

- Event organizer, International Association for Impact Assessment, BC Chapter, 2008
- Chair and Board Member, TD Friends of the Environment Foundation, Vancouver, BC, 2006-2008
- Judge, Vancouver Regional and Canada Wide Science Fairs, Vancouver, BC, 2005
- Event Promoter, Oceans Alive Community Forum, Vancouver, BC, 2003
- Wildlife Technician, Long Point and Thunder Cape Bird Observatories, Great Lakes, On, 1996
- Wildlife Technician, Humboldt Penguin Conservation Project, Punta San Juan, Peru, 1996

Selected Publications and Reports

Nelitz, M., K. Wieckowski, M. Porter, K. Bryan, F. Poulsen, and D. Carr. 2010. Evaluating the vulnerability of freshwater fish habitats to climate change and identifying regional adaptation strategies in the Cariboo-Chilcotin. Report prepared for Fraser Salmon and Watersheds Program by ESSA Technologies Ltd.

Nelitz, M., T. Douglas, and M. Rutherford. 2009. Freshwater for fish and people: Moving towards "Living Water Smart". Prepared for the Pacific Fisheries Resource Conservation Council. Available from: http://www.fish.bc.ca/freshwater-fish-and-people-moving-towards-living-water-smart

Nelitz, M., M. Porter, K. Bennett, A. Werner, K. Bryan, F. Poulsen, and D. Carr. 2009. Evaluating the vulnerability of freshwater fish habitats to the effects of climate change in the Cariboo-Chilcotin. Report prepared by ESSA Technologies Ltd. and Pacific Climate Impacts Consortium for Fraser Salmon and Watersheds Program, B.C. Ministry of Environment, and Pacific Fisheries Resource Conservation Council. Available from: http://www.thinksalmon.com/reports/PartI-MethodsReport_090314.pdf and http://www.thinksalmon.com/reports/PartII-ResultsReport_090314.pdf

Nelitz, M. and M. Porter. 2009. A future outlook on the effects of climate change on coho salmon (Oncorhynchus kisutch) habitats in the Cariboo-Chilcotin. Prepared by ESSA Technologies Ltd. for Fraser Salmon and Watersheds Program, B.C. Ministry of Environment, and Pacific Fisheries Resource Conservation Council. Available from: http://www.thinksalmon.com/reports/CohoHabitatOutlook_090314.pdf

Porter, M. and M. Nelitz. 2009a. A future outlook on the effects of climate change on bull trout (Salvelinus confluentus) habitats in the Cariboo-Chilcotin. Prepared by ESSA Technologies Ltd. for Fraser Salmon and Watersheds Program, B.C. Ministry of Environment, and Pacific Fisheries Resource Conservation Council. Available from: http://www.thinksalmon.com/reports/BullTroutHabitatOutlook_090314.pdf

Porter, M. and M. Nelitz. 2009b. A future outlook on the effects of climate change on Chinook salmon (Oncorhynchus tshawytscha) habitats in the Cariboo-Chilcotin. Prepared by ESSA Technologies Ltd. for Fraser Salmon and Watersheds Program, B.C. Ministry of Environment, and Pacific Fisheries Resource Conservation Council. Available from: http://www.thinksalmon.com/reports/ChinookHabitatOutlook_090314.pdf

Nelitz, M., C. Murray, and K. Wieckowski. 2008. Returning Salmon: Integrated Planning and the Wild Salmon Policy in B.C. Report prepared for David Suzuki Foundation, Vancouver, B.C. by ESSA Technologies Ltd., Vancouver, B.C. Available from: http://www.davidsuzuki.org/publications/downloads/2008/Returning_Salmon.pdf

Nelitz, M., K. Wieckowski, and D. Pickard. 2008. Technical review of potential impacts of Yukon Queen II operations on salmon. Final report prepared by ESSA Technologies Ltd., Vancouver, B.C. for the Yukon Environmental and Socio-Economic Assessment Board, Dawson City, YT. 48 pp.

Murray, C. and M. Nelitz. 2008. Review of Diavik and EKATI Adaptive Management Plans. Prepared by ESSA Technologies Ltd., Vancouver BC, for Fisheries and Oceans Canada, Western Arctic Area, Central and Arctic Region, Yellowknife, NT. 23 pp. Available from: http://www.mvlwb.ca/WLWB/Registry/BHP/MV2003L2-0013/MV2003L2-0013%20-%20AdMP%20-%20DFO%20Comments%20and%20ESSA%20Review%20of%20EKATI%20and%20DDMI%20AdMPs%20-%20Jun06%2008.pdf

Nelitz, M., K. Wieckowski, D. Pickard, K. Pawley, and D.R. Marmorek. 2007. Helping Pacific salmon survive the impacts of climate change on freshwater habitats: Pursuing proactive and reactive adaptation strategies. Final report prepared by ESSA Technologies Ltd., Vancouver, B.C. for the Pacific Fisheries Resource Conservation Council, Vancouver, B.C. Available from: http://fish.bc.ca/files/PFRCC-ClimateChange-Adaptation.pdf

Nelitz, M., C.A.D. Alexander, and K. Wieckowski. 2007. Helping Pacific salmon survive the impacts of climate change on freshwater habitats: Case study perspectives from the Okanagan, Quesnel, Nicola, Cowichan, Nass, and Englishman River watersheds. Final report prepared by ESSA Technologies Ltd., Vancouver, B.C. for the Pacific Fisheries Resource Conservation Council, Vancouver, B.C. Available from: http://fish.bc.ca/files/PFRCC-ClimateChange-Adaptation-CaseStudies.pdf

Nelitz, M., K. Wieckowski, and M. Porter. 2007. Refining habitat indicators for Strategy 2 of the Wild Salmon Policy: Identifying metrics and benchmarks. Prepared by ESSA Technologies Ltd. and Limnotek Research and Development, Vancouver, B.C. for Fisheries and Oceans Canada, Kamloops, B.C. Available from: http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/WSP_Habitat_Indicators_Metricsand_Benchmarks_Report_Sept5_071.pdf

Nelitz, M., K. Wieckowski, M. Porter, and C. Perrin. 2007. Refining habitat indicators for Strategy 2 of the Wild Salmon Policy: Practical assessment of indicators. Prepared by ESSA Technologies Ltd. and Limnotek Research and Development, Vancouver, B.C. for Fisheries and Oceans Canada, Kamloops, B.C. Available from: http://www-comm.pac.dfo-mpo.gc.ca/pages/consultations/wsp/WSP_Habitat_Indicators_PracticalAssessment_Report_July20_07.pdf

Nelitz, M.A., E.A. MacIsaac, and R.M. Peterman. 2007. A science-based approach for identifying temperature-sensitive streams for rainbow trout. North American Journal of Fisheries Management. 27: 405–424. Available from: http://afsjournals.org/doi/abs/10.1577/M05-146.1

Porter, M. and M. Nelitz. 2007. Preliminary analyses of the sensitivity of Fisheries Sensitive Watershed (FSW) scoring to alternative Watershed Evaluation Tool (WET) model structure, normalizations and component weightings. Prepared by ESSA Technologies Ltd., Vancouver, BC for the Ministry of Environment, Victoria, BC. 20 pp.

Nelitz, M., M. Porter, and D.R. Marmorek. 2007. Scoping document to assess the feasibility, impacts, and benefits (FIBs) of restoring anadromous salmon to the Canadian Reaches of the upper Columbia River. Prepared for Upper Columbia Aquatic Management Partnership (UCAMP) by ESSA Technologies Ltd., Vancouver, BC. 86 pp.

Murray, C., M. Nelitz, and K. Pawley. 2007. Burrard Inlet indicators development – Indicator data collection and analysis. Final Report Prepared by ESSA Technologies Ltd., Vancouver, B.C. for the Burrard Inlet Environmental Action Program, Burnaby, B.C. 91 pp.

Joint Coquitlam Water Quality Panel. 2007. Water quality monitoring design for Coquitlam reservoir from re-introduction of sockeye salmon. Report prepared for Bridge Coastal Fish and Wildlife Restoration Program, Burnaby, B.C., and Metro Vancouver, Burnaby, B.C. 33p.

Perrin, C.J., K.J. Hall, D. Marmorek, M. Nelitz, and P. Troffe. 2007. Potential risk of change in water quality in the Coquitlam Reservoir from re-introduction of sockeye salmon. Report prepared by Limnotek Research and Development Inc. and ESSA Technologies for Bridge Coastal Fish and Wildlife Restoration Program. 99 pp. Available from: www.bchydro.com/bcrp/projects/docs/bridge_river/06CO05.pdf

Nelitz, M., C. Murray, and K. Pawley. 2006. Developing environmental indicators for a State of Environment Report of Burrard Inlet. Final report prepared for Burrard Inlet Environmental Action Program, Burnaby, B.C., Prepared by ESSA Technologies Ltd., Vancouver, BC. 61 pp.

Nelitz, M., and C. Murray. 2006. Reviewing environmental impact metrics to track BC Hydro's long-term environmental performance. Final report prepared by ESSA Technologies Ltd., Vancouver, B.C. for BC Hydro, Burnaby, B.C. 106 pp.

Nelitz, M., C. Murray, M. Porter, and D.R. Marmorek. 2006. Managing Pacific salmon for ecosystem values: Ecosystem indicators and the Wild Salmon Policy. Report prepared by ESSA Technologies Ltd., Vancouver, B.C. for Pacific Fisheries Resource Conservation Council, Vancouver, BC. 76 pp. Available from: www.fish.bc.ca/files/EcosystemIndicators_2006_0_Complete%20for%20web.pdf

Horne, M., M. Nelitz, and D.R. Marmorek. 2006. Identifying the potential financial cost of environmental and social impacts for BC Hydro's IEP resource options: Phase 2. Report prepared by the Pembina Institute and ESSA Technologies Ltd., Vancouver, B.C. for BC Hydro, Vancouver, B.C. 59 pp.

Nelitz, M., P. Mera, D.R. Marmorek, and M. Horne. 2005. Identifying the potential financial liability of environmental and social impacts for BC Hydro's IEP resource options: Phase 1. Report prepared by ESSA Technologies Ltd. and Pembina Institute, Vancouver, B.C. for BC Hydro, Vancouver, B.C.

Peterman, R.M., B. Dorner, and M. Nelitz. 2005. Review of experimental design principles for projects to restore salmon populations in the Arctic-Yukon-Kuskokwim region of Alaska. Prepared for the Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative. Anchorage, Alaska. Available from: http://www.aykssi.org/docs/Project_Docs/Final_Reports/104.pdf