

SUSAN C.H. GRANT, M.Sc.

Phone (Work): 604-666-7270

Email: grants@pac.dfo-mpo.gc.ca

EDUCATION

on-going

GRADUATE DIPLOMA IN QUANTITATIVE METHODS IN FISHERIES MANAGEMENT

School of Resource and Environmental Management
Simon Fraser University, Burnaby, British Columbia

Graduate Level Courses: Risk Assessment and Decision Analysis (Dr. Randall Peterman); Quantitative Analysis in Resource Management and Field Biology (Dr. Steve Thompson); Quantitative Fisheries Stock Assessment (Dr. Sean Cox)

1995-1998

MASTER OF SCIENCE

Environmental Biology and Ecology, University of Alberta, Edmonton

Thesis: Quantitative Evaluation of Fish Recruitment Responses to Environmental Change (Nutrient Enrichment)

Graduate Level Courses: Current Problems in Ecology; Limnology; Graduate Core Course (Advanced Communication Skills); Philosophy, Sociology, and Politics of Science (Dr. David Schindler)

1989-1994

BACHELOR OF SCIENCE

Marine Biology, McGill University, Montreal

AWARDS AND GRANTS

- DFO Immediate Award, 2002 and 2003
- Circumpolar/Boreal Alberta Research Grants Awards, 1997-1998
- Myer Horowitz Graduate Scholarship, 1997-1998
- Challenge Grant in Biodiversity, 1995-1997
- National Center of Excellence (NCE), 1995-1997

LANGUAGES

- English (fluent); French (functional)

COMPUTER SKILLS

- *MSoftware:* Access; Excel; Outlook; PowerPoint; Word
- *Statistics:* R: Statistical Software; Crystal Ball (Monte Carlo simulation); VISTA (principal components analysis); SPSS, WinBugs, Turbo Pascal, DPA (creel software)
- *Graphics:* Adobe Photoshop; Optimas image analysis; CorelDraw
- *Database:* Access; Reference Manager; Endnote; DPA (creel software)

WORK EXPERIENCE

February 2008 – present

**Position: BI-03 Program Head
Sockeye & Pink Analytical
Fraser Stock Assessment**

Supervisor: Mr. Timber Whitehouse (February 2008 – present)

Area Chief, Stock Assessment, Fraser River, Fisheries and Oceans Canada

- Fraser sockeye and pink analytical lead
- Generate forecasts using models and Bayesian statistics (WinBugs and R: statistical software) for Fraser River sockeye and pink returns; completed numerous reports and presentations for technical and non-technical audiences.
- Provide advice on Fraser Sockeye and Pink stock status: productivity and abundance trends, biology, Wild Salmon Policy stock status, annual stock outlooks, etc.
- Member of the Cultus Sockeye Conservation Team
- Stock Assessment representative at Pacific Salmon Treaty processes, First Nations Treaty processes and international forums.

November 2004 – January 2008

**Position: BI-03 Program Head (Acting)
Sockeye, Pink, Chum & Creel
Fraser Stock Assessment**

Supervisor: Mr. Timber Whitehouse (April 2005 – present)

Area Chief, Stock Assessment, Fraser River, Fisheries and Oceans Canada

Supervisor: Mr. Neil Schubert (November 2004 – April 2005)

Area Chief, Stock Assessment, Lower Fraser Area, Fisheries and Oceans Canada

- Managed sockeye, pink, chum and recreational fisheries assessment programs:
 - designed, planned, directed, evaluated and reported on assessment projects;
 - managed, analyzed and interpreted data to provide scientific (stock status and fisheries impacts) and technical advice to client groups (DFO and non-DFO);
 - staffed, supervised and trained biologists and technicians;
 - directed budget tracking and financial planning and reporting;
- Coordinated Species At Risk Act (SARA) Cultus Lake sockeye projects:
 - led collaborative teams of scientists, biologists, consultants and technicians on study design development, project planning and directing, analysis, reporting;
 - managed SARA and Pacific Salmon Treaties Southern Endowment Fund (SEF) budgets (\$183K); led financial planning, proposal submissions and budgets;
 - initiated, managed and finalized contracting and staffing processes;
- Developed partnerships with Chehalis and Tsleil-Waututh First Nation (FN); provided input on the Squamish Assessment Framework and Lil'wat and Douglas FN sockeye assessment program; provided scientific/technical advice to FN groups.
- Generated forecasts using models and Bayesian statistics (WinBugs and R: statistical software) for Fraser River sockeye and pink returns; completed a technical report.
- Successfully wrote proposals for alternative funding (SARA, SEF).
- Presented results to client groups (technical, non-technical, fisheries management).

February 14 – 28, 2005
March 9 – 20, 2009

Position: BI-04 Area Chief (Acting)

Stock Assessment

Supervisor: Mr. Neil Schubert/Mr. Timber Whitehouse
Area Chief, Stock Assessment, Lower Fraser Area

- Coordinated and led stock assessment technical and biological staff in the 2005-06 budget planning process for the Stock Assessment Coordinating Committee (SACC). Initiated and supervised staff in the conversion of all budgets to a common budget template. Initiated, developed, and led group in the preparation of a comprehensive information package on a) completed budgets; b) budget rationales under different budget allocation scenarios; c) different budget versions for low to high precision study designs; and d) descriptions of each study design version.
- Led regular Program Head meetings and supervised year end expenditure tracking and spending.

September 2001 – November 2004

**Position: Biologist, Chum Salmon
and Fisheries Assessments**

Supervisor: Mr. Neil Schubert
Area Chief, Stock Assessment, Lower Fraser Area
Fisheries and Oceans Canada, 100 Annacis Parkway, Vancouver, BC

- Designed, planned, directed, and evaluated seven recreational fishery assessment field programs; designed databases, managed and analyzed data, evaluated results, and produced reports; designed a webpage for public access of assessment reports; received a DFO immediate award for my recreational fisheries assessment work.
- Compiled, analyzed and interpreted results from DFO and partnership group chum stock assessment projects to provide advice on chum stock status and fisheries impacts.
- Designed and planned the study design of a chum visual escapement study on Fraser River creeks; designed an area-under-the curve spreadsheet for escapement calculations used by DFO and First Nation's staff; designed and supervised a chum residence time study; provided a framework for future coho and chum residence time and observer efficiency studies; initiated crew exchanges between DFO and First Nation crews.
- Prepared, tracked, and managed an annual assessment budget exceeding \$100,000.
- Staffed, supervised and trained technical and data entry staff.
- Initiated, developed, and supervised technicians and biologists in the preparation of a DFO Technical reports: creel and chum/coho visual enumeration reports.
- Member of the Pacific Salmon Commission Southern Panel Chum Technical Committee, the Recreational Fisheries Data Management Working Group, the Recreational Fisheries Working Group, and the Species at Risk Working Group.
- Liaised with the Tsleil-Waututh First Nation, Squamish First Nation, and Chehalis First Nations on multi-species stock assessment projects; established a partnership with Stó:lō First Nation for recreational fisheries assessments (prepared a proposal and obtained \$46,000 in funding for capacity building with Stó:lō First Nations and trained Stó:lō technical staff); trained and supervised Soowhalie First Nation technicians for a creel project; received a DFO Immediate Award for my First Nation's partnership work.

- Initiated, designed, and supervised the development of a literature database for biological and technical staff to facilitate writing of technical reports.
- Presented results to client groups (technical, non-technical, fisheries management).

October 2000 – September 2001

Position: Scientific Contractor

Supervisor: Dr. Peter S. Ross

Research Scientist

Fisheries and Ocean Canada, Institute of Ocean Sciences, Sidney, BC

- Identified spatial and temporal trends of contaminants in Pacific salmon, killer whales and their ecosystems in British Columbia and Washington State marine waters.
- Identified local point sources (e.g. sewage treatment plants, landfills, pulp mills, mines) and regional/global non-point sources (e.g. combined sewer outfalls, agricultural activities, atmospheric transport, etc.) of contaminants in these regions.
- Completed a comprehensive review of existing information and literature to identify the extent of regional contaminant sources.
- Created a literature database and library of reports and journal articles.
- Successfully wrote two research proposals to: a) study contaminants in the Vancouver Island Marmot (\$15K) and b) study contaminants and their effects on sockeye salmon (*Oncorhynchus nerka*) (\$10K).
- Weekly contributor to the Institute of Ocean Sciences “Ecotox Newsletter”.
- Published a DFO Technical Report (primary author) and presented results at international conferences.

October 2000 – September 2001

Position: Scientific Contractor

Supervisor: Dr. Robie W. Macdonald

Research Scientist

Fisheries and Ocean Canada, Institute of Ocean Sciences, Sidney, BC

Project Objective: To determine spatial trends and sources of contaminants in the Arctic marine food web (zooplankton and fish).

- Conducted multivariate principal components analysis on contaminant concentrations measured in zooplankton and fish in the Arctic Ocean to identify spatial trends.
- Described the Arctic food web using stable carbon and nitrogen isotope data.
- Conducted statistical analysis and prepared charts, figures, and tables.
- Conducted an extensive literature review and managed literature with reference management software.

January 2000 – September 2000

Position: Biological Research Assistant

Supervisor: Dr. David W. Welch

Program Head, High Seas Salmon Research & PICES-GLOBEC Co-Chair

Climate Change & Carrying Capacity Implementation Plan

Fisheries & Oceans Canada, Pacific Biological Station, Nanaimo, BC

Project Objective: To study the effects of climate change on Pacific salmon (*Oncorhynchus* sp.) populations.

- Participated in research cruises to sample five species of Pacific salmon and water quality in the North Pacific Ocean (including the B.C., Washington, and Alaskan coast).
- Sampled fish tissues (mercury, cesium, DNA, and stable isotope analysis), fish ageing structures (otoliths and scales) and stomach contents, water (chlorophyll *a*, nitrates, phosphates, dissolved oxygen, temperature, and salinity), and zooplankton.
- Contributed to writing a successful research proposal for Bonneville Power (U.S.A.).
- Analyzed otoliths and scales for age and growth determination; researched otolith microchemistry techniques (stable isotopes and elemental analysis) used to distinguish between stream- versus ocean-type chinook salmon.
- Designed databases and managed and analyzed data for reports and publications.

June 1999 – January 2000

Position: Production Assistant

- Worked as a production assistant for Hansard (in the Legislative Assembly of British Columbia); updated the Hansard website; responsible for desktop publishing and proofreading; worked for the Capital Health Region to manage databases and statistics.

September 1995 – December 1998

Position: Graduate Student

Supervisor: Dr. William Tonn, Associate Professor, University of Alberta, Edmonton

Project Objective: To quantitatively evaluate responses in fish populations (recruitment dynamics) to environmental change (increased nutrient loads).

- Designed, planned, and directed a three year fish recruitment field and laboratory study.
- Hired, trained and supervised a team of research assistants in field and laboratory work.
- Wrote successful research proposals (\$30K); prepared, tracked, managed the project's budget; prepared and submitted financial reports to funding agencies.
- Designed, planned, directed and implemented a sampling program for fish populations (egg, juvenile, and adult production, population structure: age, sex, and condition), ecosystem productivity (phytoplankton, periphyton, zooplankton, benthic invertebrates) and water quality (nitrates and phosphates, dissolved oxygen, pH, conductivity, and chlorophyll *a*, Secchi disc depth, vertical illumination, temperature).
- Conducted laboratory analysis of chlorophyll *a*, phosphorus, dissolved oxygen, and pH.
- Developed otolith analysis methods to assess fish age, growth, and survival.
- Designed databases and managed large data sets.
- Conducted quantitative statistical analysis and modeling of ecological data.

- Wrote proposals, progress reports, final reports, committee reports, a final thesis manuscript (170 pages), and a publication in the primary literature (CJFAS).
- Presented results at international conferences and meetings.
- Organized and maintained a literature database and a filing system for research papers.

November 1996 – May 1997

Position: Research Assistant

Supervisors: Dr. Cindy Paszkowski, Associate Professor, and Paula Siwik, M.Sc., University of Alberta, Edmonton, AB

Project Objective: To study the toxicological effects of oil sand process wastewater from Syncrude Canada on fathead minnow populations.

- Examined short-term (seven-day growth and survival) and long-term effects of oil sand process wastewater on reproduction, growth and survival of fish.
- Reared and cultured larval, juvenile, and adult fathead minnows.

January 1996 – May 1996

Position: Research Assistant

Supervisors: Dr. William Tonn, Associate Professor, and Andy Danylchuk, PhD Candidate, University of Alberta, Edmonton, AB

Project Objective: To investigate the impacts of clear-cut logging and varying riparian buffer strip widths on fish populations in northern Alberta.

- Goal was to provide guidelines for mitigating the effects of logging activities.
- Processed adult fathead minnow specimens. Extracted otoliths, scales, gonads, and digestive tract. Qualitatively assessed fish condition, sex, and the gonadosomatic index.

May 1995 – September 1995

Position: Field Research Assistant

Supervisors: Dr. William Tonn, Associate Professor, University of Alberta, Edmonton, AB, Rena Vandenbos, M.Sc., and Mariola Janowicz, M.Sc.

Project Objectives:

1. To determine top-down, bottom-up trophic control on water quality.
 2. To determine density-dependent mechanisms affecting fish population dynamics.
- Field research was conducted at the Meanook Biological Station, Athabasca, AB.
 - Monitored fish productivity in the egg, juvenile and adult stages, water quality (nutrient concentrations, pH, chlorophyll *a*, temperature, Secchi disc depth, and vertical illumination), and ecosystem productivity (phytoplankton, periphyton, zooplankton, benthic invertebrates).
 - Conducted laboratory analysis (chlorophyll *a*, phosphorus, nitrogen, dissolved oxygen).
 - Identified and quantified zooplankton in samples to the genus level.
 - Designed and managed databases, conducted statistical analysis, prepared figures/tables.

May 1994 – May 1995

Position: Research Assistant

Supervisors: Dr. William Leggett, Dr. Mathew Sclafani, Dr. Tom Miller, McGill University, Montreal, Quebec

Objective: To assess condition-driven vertical migration of young cod (*Gadus morhua*); results from this study are applied to the prediction of larval transport and recruitment in cod using modelling approaches.

- Conducted research at the Ocean Sciences Centre, Memorial University, St. Johns, Newfoundland and at research facilities at McGill University, Montreal, Quebec.
- Set-up marine rearing facilities in both locations; obtained cod eggs and reared larvae.
- Captured and saved images of young fish and fish eggs using imaging software (OptimasTM); enhanced images using several different image filters; wrote macro programs to automate measurements; measured enhanced images.
- Conducted experiments on cod larvae to validate daily increment formation.
- Read and critiqued relevant journal articles.
- Designed databases and input, error checked, and managed large data sets.

TEACHING EXPERIENCE

January 1996 – December 1997

Teaching Assistant, University of Alberta

- Instructed laboratories, prepared and conducted lectures, and led group discussions.
- Edited over 100 proposals, reports, and term papers prepared by undergraduate students on a variety of scientific topics; edited laboratory manuals.
- Designed and wrote exams and quizzes and tutored students on course material.

Courses Taught:

(Biology 338): Community Ecology

A study of niche theory (food webs, competition, predation, disturbance and their effects on community diversity). Labs also emphasized communication skills in scientific research (scientific reports, research papers, and presentations).

(Biology 224): Vertebrate Diversity

A comparative survey of vertebrates; focused on their morphology, classification, and phylogeny. Labs involved specimen examination and comparative anatomy.

(Biology 208): Principles of Ecology

Scientific study of the interactions between organisms and their environment in a hierarchy of levels of organization (individuals, populations, communities, and ecosystems). Labs emphasized communication skills (written and oral) and the collection, analysis, and interpretation of data from ecological experiments.

COURSES AND TRAINING

- Finance, Admin., Contracting & Spending (FACS: DFO) July 8, 2010
- CPR and Wilderness First Aid (Saint John's Ambulance) March 18-20, 2009
- The Essentials of Managing in the Public Service (G110:DFO) Feb 2-6, 2009
- Integrated Business and Human Resource Planning (DFO) Jan. 21-23, 2008

• Personal Learning Plan training (DFO)	May 4, 2007
• Preparation for a selection process (DFO)	May 4, 2007
• OSH training Module 1 to 6 (DFO)	April 24-26, 2007
• Staffing for Delegated Managers	Mar. 5-8, 2007
• Media Training: television, radio, print	Feb. 21, 2007
• Finance Training (DFO)	Dec. 2006
• Quantitative Stock Assessment (SFU; Grade: A)	Sep.-Dec. 2006
• Quantitative Analysis (SFU; Grade: A)	Jan.-Apr. 2006
• Presentation Course (DFO)	April 13-14, 2005
• Explorer First Aid and CPR (Wilderness Alert)	Feb. 7, 2003
• Risk Assessment and Decision Analyses (SFU; Grade: A)	Dec.- Jan. 2003
• French Conversation Course (UBC)	Sep.-Dec. 2003
• Interpersonal Conflict Resolution (Justice Institute)	Mar. 4, 2002
• Manager's Handbook on Staffing and Recruitment (DFO)	Jan. 28, 2002
• Bayesian Statistics (Paul Starr)	Dec. 12, 2002
• Swiftwater Training (Rescue Canada)	Dec. 2, 2002
• Management Development Training (DFO)	Nov. 18, 2002
• Staff Relations Course (DFO)	July 10, 2002
• Emergency Response Training (DFO)	June 17, 2002
• Harassment Training (DFO)	Feb. 21, 2002
• Diversity Training (DFO)	Jan 16, 2002

PUBLICATIONS

Grant, S.C.H. 2010. Angler Effort and Catch in the 2001-2005 Lower Fraser River Sport Fishery. Can. Tech. Rep. Fish. Aquat. Sci. (in prep.).

Grant, S.C.H. 2010. Angler Effort and Catch in the 2001-2005 Chilliwack River Sport Fishery. Can. Tech. Rep. Fish. Aquat. Sci. (in prep.).

Grant, S.C.H., Michielsens, C.G.J., Porszt, E.J. & Cass, A. 2010. Pre-season run size forecasts for Fraser River Sockeye salmon (*Oncorhynchus nerka*) in 2010. Can. Sci. Advis. Sec. Res. Doc. 2010/042.

http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2010/2010_042_e.htm

DFO (written by Grant, S.C.H.). Pre-season run size forecasts for Fraser River Sockeye salmon (*Oncorhynchus nerka*) in 2010. Can. Sci. Advis. Sec. Rep. 2010/031.

http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2010/2010_031_e.htm

Grant, S.C.H. & Michielsens, C.G.J. 2010. Fraser River Sockeye Salmon productivity and 2010 return forecasts. pp 121-124. In Crawford, W.R. & Irvine, J.R. eds. 2010. State of physical, biological, and selected fishery resources of Pacific Canadian marine ecosystems in 2009. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/053. viii +137 p.

http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2010/2010_053_e.htm

DFO (written by Grant, S.C.H. & Cass, A.). 2008. Pre-season run size forecasts for Fraser River sockeye & pink salmon in 2009. Canadian Science Advisory Secretariat. Sci. Advis. Rep. 2008/049.

http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2009/2009_022_e.htm

Grant, S.C.H. 2009. Fraser River Sockeye forecasts (stock-recruitment data). pp 114-117. In Crawford, W.R. & Irvine, J.R. eds. 2009. State of the Pacific Ocean in 2008. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/022. vi +121 p.

http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2009/2009_022_E.pdf

Grant, S.C.H. & Cass, A. 2007. Pre-season run size forecasts for Fraser River sockeye salmon in 2008. Canadian Science Advisory Secretariat. Sci. Advis. Rep. 2007/049

http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007_049_E.pdf

Grant, S.C.H. 2008. Fraser River Sockeye pre-season forecasts for 2008. pp 106-109. In Crawford, W.R. & Irvine, J.R. eds. 2008. State of the Physical, Biological and Selected Fishery Resources of Pacific Canadian Marine Ecosystems. DFO Can. Sci. Advis. Sec. Res. Doc. 2008/013. ii +109 p.

http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2008/2008_028_e.htm

DFO (written by **Grant, S.C.H.** and Cass, A.). 2006. Pre-season run size forecasts for Fraser River sockeye and pink salmon in 2007. Canadian Science Advisory Secretariat. Sci. Advis. Rep. 2006/043

http://www.dfo-mpo.gc.ca/csas/Csas/status/2006/SAR-AS2006_043_e.pdf

Grant, S.C.H., Kayln, S.M., Mahoney, J.E., & Tadey, J.A. 2007. Coho (*Oncorhynchus kisutch*) and chum (*O. keta*) salmon visual enumeration surveys in Lower Fraser Area Streams: 1999-2006. Can. Tech. Rep. Fish. Aquat. Sci. No. 2727.

[Coho \(*Oncorhynchus kisutch*\) and chum \(*O. Keta*\) salmon visual enumeration surveys in twenty-six lower Fraser area streams : 1999-2005](#)

Bradford, M., Amos, J., Tovey, C.P., Hume, J.M.B., **Grant, S.**, Mossop, B. 2007. Abundance and migratory behaviour of northern pikeminnow (*Ptychocheilus oregonensis*) in Cultus Lake, British Columbia and implications for predator control. Can. Tech. Rep. Fish. Aquat. Sci. No. 2723, 54 pp.

[Abundance and migratory behaviour of northern pikeminnow \(*Ptychocheilus oregonensis*\) in Cultus Lake, British Columbia and implications for predator control](#)

Grant, S.C.H. and P.S. Ross. 2002. Southern Resident Killer Whales at Risk: Toxic Chemicals in the British Columbia and Washington Environment. Can. Tech. Rep. Fish. Aquat. Sci. No. 2412.

[Southern resident killer whales at risk \[i.e. risk\] : toxic chemicals in the British Columbia and Washington environment](#)

Grant, S.C.H. and W.M. Tonn. 2002. Effects of nutrient enrichment on recruitment of age-0 fathead minnows (*Pimephales promelas*): potential impacts of environmental change on the Boreal Plains. Can. J. Fish. Aquat. Sci. 59: 759-767.

[HTTP://ARTICLE.PUBS.NRC-](http://article.pubs.nrc-cnrc.gc.ca/FPAS/rpv?HM=HINIT&CALYLANG=ENG&JOURNAL=CIFAS&VOLUME=59&AFPF=F02-054.PDF)

[CNRC.GC.CA/FPAS/rpv?HM=HINIT&CALYLANG=ENG&JOURNAL=CIFAS&VOLUME=59&AFPF=F02-054.PDF](http://article.pubs.nrc-cnrc.gc.ca/FPAS/rpv?HM=HINIT&CALYLANG=ENG&JOURNAL=CIFAS&VOLUME=59&AFPF=F02-054.PDF)

Kiesling (Grant), S.C.H. 1999. Effects of nutrient enrichment on recruitment of age-0 fathead minnows (*Pimephales promelas*). M.Sc. Thesis, University of Alberta. 170 pages.