

Sonja Saksida BSc, DVM, MSc

REDACTED

PROFILE

Over 15 years in aquatic health management with extensive experience in fish health management in a wide variety of fish species including salmonids, tilapia, sturgeon, cobia and koi and shellfish such as oysters, clams and shrimp. A keen interest in animal welfare and environmental sustainability and outbreak investigations.

An ever-improving communicator having extensive experience in presenting information to a wide variety of audiences locally and internationally including academics and scientists, governmental organizations and non governmental organizations (e.g. BC Special Committee on Aquaculture, Pacific Salmon Forum, World Wildlife Fund), and community groups (e.g. Rotary Club, Toast Masters).

Capable of working independently and part of a team. A strong focus on getting the job done, well. An ability to develop practical and novel solutions.

Have a large national and international network of research collaborators.

PROFESSIONAL EXPERIENCE

2009 – BC Centre for Aquatic Health Sciences Campbell River, BC
Executive Director / Researcher

- As the Executive Director, I am responsible for the successful leadership and management of the Centre; overseeing the efficient and effective day-to-day operation of the facility and ensuring that BC CAHS meets the expectations of its clients, Board and funders. The position includes working with the Board of Directors in developing a vision and strategic plan to guide the organization and ensuring that the centre operates in a fiscally sustain manner. In addition to the ED role, I continue to be involved in fish health research and services at BC CAHS.

2005 – 2009 BC Centre for Aquatic Health Sciences Campbell River, BC
Director of Fish Health (part-time)

- Position includes proposal writing, study design, implementation and managing the project and research staff, data analysis and preparation of report/manuscripts and presentations. I have been involved in research on farmed aquatic species and wild aquatic species issues as well as the interaction between the two. I have been involved in organizing and running seminars and training courses. The small size of the Centre has allowed me to be involved in growth strategy development. The position involved interacting with researchers, government officials, industry, ENGOs and the public and lobbying government and private industry for additional funding.

2000 – Present Sea to Sky Veterinary Services Campbell River, BC
Private Veterinary Consulting Practice

- Self employed consultancy business providing veterinary service to clients in fin fish aquaculture including salmonid species, white sturgeon and sablefish and Tilapia. Also provided veterinary services for koi industry. I have been involved in various disease/infection related research projects including: Amoebic gill disease, Infectious hematopoietic necrosis, Kudoa and sea lice. I have designed field trials and provided statistical analysis assistance to aquaculture companies and BCMAL. As the sole proprietor of a successful business, I was responsible for all aspects of business operations including procuring and negotiating all contracts, writing reports and proposals, all purchasing, accounting and budgeting (money and time).

1994 – 2000 EWOS Canada Ltd

Campbell River, BC

Veterinarian

- Provided veterinary service to EWOS clients in the aquaculture industry. Managed the EWOS fish health laboratory and technical staff. Participated in an in-house fish health group which allocates funding for fish health related research projects. Design and carry out field trials on fish health products

EDUCATION

1992 – 1995 University of Guelph

Guelph, Ontario

Masters in Science

- Studied Veterinary Epidemiology

1997 – 1992 University of Guelph

Guelph, Ontario

Doctor of Veterinary Medicine

1982 – 1987 University of Guelph

Guelph, Ontario

Bachelor of Science

- Majored in Marine Biology

PROFESSIONAL MEMBERSHIPS

BC Veterinary Medical Association (BCVMA)

Canadian Veterinary Medical Association (CVMA)

Association of Aquaculture Veterinarians of BC (AAVBC)

International Society of Aquatic Animal Epidemiology (ISAAE)

European Association of Fisheries Pathologists (EAFP)

American Fisheries Society (AFS)

COMMITTEES AND WORKING GROUPS

Cohen Commission on Sockeye Salmon – Expert Report Reviewer

Selection committee for the 8th Annual International Sea Lice Conference, Victoria, BC May 9 – 12, 2010

Fisheries and Oceans CSAS Pathways of Effect Review – Pathogen pathways reviewer

Global Aquaculture Alliance – Salmon Standards Development technical committee

Canadian Council on Animal Care –facility assessment member

Animal Care Committee for Bamfield Research Station

National Fish Health for Aquaculture Working Group – Fisheries and Oceans Canada (DFO), Health Canada

Fisheries and Oceans CSAS Closed Containment Review– Fish Health reviewer

Inter Lice (Compare Lice) working group – working group composing of researchers from Norway, Scotland, Ireland and Canada

Speaker selection committee for the 7th Annual International Sea Lice Conference, Chile March 31, April 1 2008

INTERESTS AND ACTIVITIES

My Family, Biking (MTN, Road), Water Sports (Kayaking, Swimming, Sailing), Mtn Sports (Hiking, Ski Touring)

Strait of Georgia Wild Juvenile Salmon Health Survey (2010, 2011). Assist DFO in their field collection in the Strait of Georgia and Johnstone Strait as well as provide lab diagnostic services (i.e. sea lice assessment and viral screening). Project funded by DFO, Pacific Salmon Foundation and Marine Harvest Canada (estimated @ \$70,000).

Practical Tools for Managing Bacterial Kidney Disease- Workshop. Organized and held a one day workshop to discuss current techniques used by commercial and government salmon facilities for the control of Bacterial Kidney Disease, one of the most serious diseases in salmon. The goal of the workshop was to share information as well as to determine gaps in better controlling this disease. This workshop was held June 13, 2011 in Nanaimo, BC as the Continuing Education Workshop associated with the American Fisheries Society Fish Health Conference. The project was funded by ACRDP and Creative Salmon (\$42,000)

Genomic characterization of jaundice-associated mortality events in cultured Chinook salmon. This project will apply functional genomics technology to gain a better understanding of the factors that may underlie the poorly understood jaundice-related disease experienced by farmed Chinook salmon in British Columbia. The principal investigator is Dr Kristi Miller (DFO) and I am the co-investigator. The project has been funded by ACRDP and Creative Salmon (\$95,000)

Assessing the feasibility of an integrated pest management approach for the control of Kudoa thyrssites in farmed Atlantic salmon in British Columbia. This project will identify the risk factors associated with the expression of K. thyrssites in farmed Atlantic salmon in BC as well as assess the efficacy of a therapeutant for the treatment of the parasitic infection. The principal investigator is Dr Simon Jones (DFO) with all three major Atlantic salmon growers in BC as industry partners. I along with Dr Carol McClure (CAHS –PEI) are co-investigators and will be conducting the epidemiological component of the study. This project was funded by the Aquaculture Collaborative Research and Development Program (ACRDP) and the Atlantic salmon farmers of BC (\$118,000)

Mouth Rot – Tenacibaculum maritimum- tracking pathogenesis and typing. This project has been designed to improve the understanding of this disease in Atlantic Salmon in BC. The project involves assessing the histological changes associated with the progression of this disease, assessing differences in the progression and severity of the disease between regions. The principal investigator is Dr Stewart Johnson (DFO). Dr Luis Afonso (BC-CAHS), Dr Peter McKenzie (Mainstream) and I are co-investigators. I will be conducting the epidemiological investigation of the project and will be involved in the preparation of the final report. The project has been funded by ACRDP and Mainstream Canada (\$85,000)

Quinsam Plankton Project. This is the fourth year of a project which is the investigating the value of using plankton (phytoplankton and zooplankton) levels to time enhance Coho salmon releases. I have been the principal investigator for the project, with significant rolls played by Elan Downey (BC-CAHS), David Ewart and Shannon Anderson (DFO). Funding for this project has come from various groups including the Pacific Salmon Foundation, Campbell River Salmon Foundation, Local fishing lodges, the City of Campbell River, Local Salmon Farming Companies and the Provincial Government (estimate to date @ \$175,000).

Sentinel Cage Project. This pilot project was developed to assess sentinel cage configuration developed in Scotland for sea lice settlement research and determine the optimum locations for the siting of these types of cage within the Broughton Archipelago. The principal investigator is Dr Simon Jones (DFO), Marine Harvest Canada was the industry partner. I was involved in the location selection, managing sample collection and evaluation as well as data analysis. The project was funded by ACRDP

(\$59,400)

Broughton Pink Salmon Health. This was a two year project that was evaluated the health of juvenile pink salmon in the Broughton Archipelago during their out-migration (2007 and 2008). I was the principal investigator. This project was a collaboration with DFO (Dr Simon Jones), BCMAL (Drs Gary Marty and Ian Keith) and the University of Idaho (Dr Sophie StHilaire). The project was funded by the Pacific Salmon Forum (\$125,000).

Kitasoo Fisheries Program Juvenile Pink Salmon Sample Analysis 2004-2008. This project provided technical support in the area of sea lice and fish species identification for samples collected by the Kitasoo First Nations between 2004-2008. The Principle investigator was Larry Greba. I was involved in data analysis, report generation and presentations. I was also asked to provide input on how to improve future sampling. My component of the project was funded by the Pacific Salmon Forum (\$12,500).

Evaluation for temporal and spatial associations among levels of sea lice on farmed Atlantic salmon and wild juvenile salmon through retrospective analysis of data collected in the Broughton Archipelago from 2003 to 2006. The project objectives was to complete a retrospective analysis of spatial and temporal associations in sea lice abundance on out-migrating wild juvenile pink and chum salmon and farmed salmon in the Broughton Archipelago and to evaluate for variations in environmental factors which may explain observed variations seen in lice levels. A mathematical/statistical model which would incorporate both the wild salmon and farm salmon data and appropriate oceanography data would be developed. I was the principal investigator. This project was a collaboration with DFO (Dr Simon Jones, Dr Brent Hargreaves, Mr Dario Stucchi), BCMAL (Dr Joanne Constantine), University of Bremen (Dr Werner Wosniok) and Dr Alan Donald. This project is awaiting the final report from Dr Wosniok. Funding was received from PSF, DFO and BCMAL (\$85,000)

PUBLICATIONS

Saksida SM, Marty GD, Jones SRM, Manchester HA, Diamond CL, Bidulka J, St-Hilaire S. (submitted) Health assessments of juvenile pink salmon (*Oncorhynchus gorbuscha*) in the Broughton Archipelago of western Canada. Journal of Fish Diseases.

Saksida SM, Greba L, Morrison D, Revie CW (submitted) Sea lice on wild juvenile Pacific salmon and farmed Atlantic salmon in the northernmost salmon farming region of British Columbia. Aquaculture.

Marty, G.D., **Saksida, S.M.**, and Quinn II, T.J. 2010. Relationship of farm salmon, sea lice, and wild salmon populations. Proc. Natl. Acad. Sci. U. S. A. 107(52): 22599–22604. doi:10.1073/pnas.1009573108.

Saksida SM, Morrison D, Revie CW (2010) The efficacy of emamectin benzoate against infestations of sea lice (*Lepeophtheirus salmonis*) on farmed Atlantic salmon (*Salmo salar* L) in British Columbia. Journal Fish Diseases 33:913-918.

Chittenden CM, Jensen J, Ewart D, Anderson S, Balfry S, Downey E, Eaves A, **Saksida S**, Smith B, Vincent S, Welch D, McKinley RS (2010) Recent Salmon Declines: A result of lost feeding opportunities due to bad timing? PLoS ONE 5(8):312423. doi:10.1371/journal.pone.0012423.

Saksida S, Morrison M, Sheppard M, Keith I. (submitted) Book Chapter : Sea Lice management on Salmon Farms in British Columbia, Canada.

VHSV Expert Panel and Working Group member (2010) Viral hemorrhagic septicemia virus (VHSV IVb) risk factors and association measures derived by expert panel. Preventive Veterinary Medicine 94: 128-139.

McClure CA, **Saksida S**, Karreman G, Constantine J, Robinson J, Traxler GS, Hammell KL.(2008) Evaluation of a Reverse Transcriptase Polymerase Chain Reaction Test and Virus Isolation on Field Samples Collected for the Diagnosis of Infectious Hematopoietic Necrosis Virus in Cultured Atlantic Salmon in British Columbia. Journal of Aquatic Animal Health 20:12-8.

Saksida S, Karreman G.A., Constantine J. Donald A. (2007). Differences in *Lepeophtheirus salmonis* abundance levels on Atlantic Salmon farms in the Broughton Archipelago British Columbia Canada. Journal of Fish Diseases 30:357-366.

Saksida S, Constantine J., Karreman G.A, Donald A. (2007). Evaluation of sea lice abundance levels on farmed Atlantic salmon (*Salmo salar*) located in the Broughton area of British Columbia from 2003-2005. Aquaculture Research 38:219-231.

Beamish, R.J., Jones, S., Neville, C.M., Sweeting, R., Karreman, G., **Saksida, S.**, and N. Ambers (2006) Exceptional marine survival of pink salmon that entered the marine environment in 2003 suggests that farmed Atlantic salmon and Pacific salmon can coexist successfully in a marine ecosystem on the Pacific coast of Canada. ICES Journal of Marine Sciences 63, 1326-1337.

Saksida S. (2006) The 2001-2003 infectious hematopoietic necrosis (IHN) epidemic in farmed Atlantic salmon (*Salmo salar* L.) in British Columbia, Canada. Diseases of Aquatic Organisms 72:213-223.

Saksida S, Constantine J, Brackett J. (2005) Water Movement and Fish Health Management of Infectious Diseases on Salmon Farms in British Columbia, Bulletin of the Aquaculture Association of Canada 105(1) 60-66.

Douglas-Helders M, **Saksida S**, Nowak BF. (2005) Questionnaire-based risk assessment for amoebic gill disease (AGD) and evaluation of freshwater bathing efficacy of reared Atlantic salmon (*Salmo salar* L.) Diseases of Aquatic Organisms 63:175-84.

Raverty S, Hedrick R, **Saksida S**. (2003) Diagnosis of sturgeon iridovirus infection in farmed white sturgeon (*Acipenser transmontanus*) in British Columbia. Cross Canada Disease Report. Canadian Veterinary Journal 44(4):327-328.

Douglas-Helders M, **Saksida S**, Raverty S, Nowak BF. (2001) Temperature as a risk factor for outbreaks of Amoebic Gill Disease in Atlantic salmon. Bulletin of the European Association of Fish Pathologists 21(3): 114-116.

Saksida SM, Thorburn MA, Speare DJ, Markham RJF, Kent ML (1999) A field evaluation of an indirect immunofluorescent antibody test developed to diagnose plasmacytoid leukemia in chinook salmon (*Oncorhynchus tshawytscha*). Canadian Journal of Veterinary Research 63:107–112.

Newbound GC, Markham RJ, Speare DJ, **Saksida SM**, Despres BM, Horney BS, Kibenge FS, Sheppard JA, Wright GM, Kent ML.(1993) Production of monoclonal antibodies specific for antigens derived from tissue of Chinook salmon (*Oncorhynchus tshawytscha*) affected with plasmacytoid leukemia. American Journal of Veterinary Research 54(9):1426-31.

Saksida S. Galloway P. White Paper - Impacts of Bacterial Stomatitis on Salmon Farming in the Pacific Northwest. Prepared for Novartis Animal Health Canada (2011)

Eaves A, Downey E, Galloway P, **Saksida S.** White Paper - Evaluation of Bacterial Kidney Disease (BKD) Impacts on the Canadian Salmon Aquaculture Industry. Prepared for DFO (2010).

Saksida S. White Paper - Sea lice in BC. Prepared for the BC Salmon Farming Association (2009).

Downey E, **Saksida S**, Anderson S., Ewart D. Discovery Passage Plankton Monitoring and Juvenile Salmon Assessment 2008. Prepared for Fisheries and Oceans Canada (2008).

Saksida S, Downey E. Overview of sea lice issues and risk factors for farmed and wild salmon in British Columbia. Prepared for Cermaq ASA (2008)

Downey E, **Saksida S**, Anderson S., Ewart D. Discovery Passage Plankton Monitoring and Juvenile Salmon Assessment 2007. Prepared for Fisheries and Oceans Canada (2007).

Saksida S. White Paper - Infectious Hematopoietic Necrosis: updated review and considerations for continued research needs based on the presentations and discussions at the workshop on IHN research. Prepared for the BC Aquaculture and Research Committee of the BC Innovation Council (2007).

Hammell L, McClure C, **Saksida S**, Karreman G, Constantine J, Robinson J, Traxler G, Dahoo I, Stryhn H. Preliminary report: evaluation of a reverse transcriptase-polymerase chain reaction (RT-PCR) test and virus isolation on field samples collected for the diagnosis of IHNV in cultured Atlantic salmon in British Columbia. Prepared for the Science Council of British Columbia (2005).

Saksida SM. Investigation of the 2001-2003 IHN epizootic in farmed Atlantic salmon in British Columbia. Report prepared for the BC Ministry of Agriculture, Fisheries and Food and BC Salmon Farmers Association 2004. [http:// www.agf.gov.bc.ca/fisheries/health/IHNV_report_2003.pdf](http://www.agf.gov.bc.ca/fisheries/health/IHNV_report_2003.pdf)

Saksida S. Management of Amoebic Gill Disease in Salmon Aquaculture in Tasmania. Prepared for B Nowak, Department of Aquaculture, University of Tasmania and the Tasmanian Aquaculture Association (2003).

Karreman G, **Saksida S**, Jones S and Stephen C. Reducing the impact of *Kudoa thyrsites* in farmed Atlantic salmon in British Columbia. Prepared for Science Council of British Columbia and the BC Salmon Farmers Association (2003).

Saksida SM. Investigation of the 2001-2002 IHNV epizootic in farmed Atlantic salmon in British Columbia. Prepared for the BC MAFF and BCSFA (2002).

CONFERENCE ABSTRACTS / PROCEEDINGS

Saksida S M, Greba L, Morrison D, Revie CW Sea lice on wild juvenile Pacific salmon and farmed Atlantic salmon in the northernmost salmon farming region of British Columbia. Sea Lice 2010, Victoria BC Canada May 9-12.

Pert CC, Asplin L, Jones SRM, O'Donohoe P, **Saksida SM**, Kroon Boxaspen K. The use of sentinel cages to investigate infection pressure from sea lice in Scotland, Canada, Norway and Ireland. Sea Lice 2010, Victoria BC Canada May 9-12.

Saksida S. Sea Lice on BC Farms – so what are they hiding? Aquaculture Association of Canada Conference, Nanaimo BC May 11- 13 2009.

Saksida S, Kreiberg H, Grydeland O, Funk V, Downey E. (2009) Toward consistent good welfare in harvested farmed salmon: Field trial of a Sotra Singelstunner™ electric stunner. The Proceedings of Aquaculture Canada^{OM} 2009.

Saksida S, Marty G, Manchester H, St Hilaire S, Jones S. Assessment of health in wild juvenile salmon in British Columbia Canada. 7th International Sea Lice conference, Pt Veras Chile March 31- April 1 2008.

Saksida S. A description of motile *Lepeophtheirus salmonis* abundance levels on farmed Atlantic salmon (*Salmo salar*) in two farming regions in British Columbia Canada 2004-2007. 7th International sea lice conference, Pt Veras Chile March 31, April 1 2008.

Saksida S, Evaluation of sea lice abundance levels on farmed Atlantic salmon in British Columbia, Canada. World Aquaculture San Antonio Texas March 1, 2007.

Saksida S., Constantine J., Karreman G.A., Neville C., Sweeting R., Beamish R. (2006) Evaluation of Sea Lice, *Lepeophtheirus salmonis*, abundance levels on farmed Salmon in British Columbia, Canada. Proceedings of the 11th Symposium of the International Society for Veterinary Epidemiology and Economics, Cairns, Australia: ISVEE 11, 159, 2006

PRESENTATIONS (INVITED)

Environmental impacts of aquaculture. Presented at the Animal Welfare Forum, Novartis. Cambridge MA, March 9-11, 2011

Fish Welfare: Understanding the issues in farming fish. Presented at the Aquaculture Association of Canada Conference. Nanaimo BC, May 11-13, 2009

Fish health concerns in BC aquaculture. Presented at the National Coordination Workshop on fish health management. Vancouver BC, September 8, 9 2008.

Summary of current therapeutant use for the treatment of sea lice in aquaculture worldwide. Presented at the International Salmon Farmers Association Sea Lice Workshop, Trondheim Norway, August 13, 2007.

Managing Fish Health in British Columbia. Presented at the WWF Salmon Aquaculture Dialogue, Vancouver BC, November 29, 2006.

Report on Sea lice Abundance on farmed Atlantic salmon in the Broughton Archipelago 2003-2005. Presented for the BC Pacific Salmon Forum committee, Nanaimo BC January 24, 2006.

Water movement and farmed salmon health management in British Columbia. Presented at the 4th Annual DFO/AAC Aquaculture Workshop: Water Movement and the Management of Aquatic Animal Health, St Andrews NB, November 21 2005.

Salmon Production Practices. Presented at the BC Centre of Aquatic Health Sciences Fish Welfare Workshop, Campbell River BC September 2004.

IHN Investigation: Risk factors associated with 2001/02 Epizootic. Presented at IHN Research Summit, Campbell River BC January 2003.

Investigation of Infectious Hematopoietic Necrosis (IHN) infection in Atlantic salmon in British Columbia. Presented at Aquaculture Canada, Charlottetown, PEI September 2002.

Retrospective Investigation of 2001/2002 IHN Cases. Presented at IHN Workshop, Nanaimo BC June 2002.

