

SFU



FREE WORKSHOP
Thursday,
November 29, 2007
8 am–6 pm

Morris J. Wosk Centre
for Dialogue, Vancouver
Campus, Simon Fraser
University, 580 West
Hastings, Asia Pacific Hall,
Vancouver, BC

For more information,
email cs-science@sfu.ca or
telephone 778.782.5466.

Hosted by Continuing
Studies in Science and the
Centre for Coastal Studies
at Simon Fraser University

Sponsored by the
Consortium for Genomic
Research on all Salmonids
Project (cGRASP)
and the Linking Science
with Local Knowledge
Working Group of the
Ocean Management
Research Network
(OMRN)

Encouraging Innovative Solutions for Sustainable Salmon Aquaculture

It is well recognized that globally we will need aquaculture in the future as the pressures increase to provide food for the burgeoning world population, and particularly fish protein. Wild fisheries, as currently exploited, will not be able to meet these needs.

The purpose of this dialogue-based workshop is to examine and suggest innovative ways for the British Columbia salmon aquaculture industry to move forward in a sustainable fashion, with minimal impacts on the existing wild salmon stocks and coastal ecosystems.

The British Columbia Legislative Special Committee on Sustainable Aquaculture addressed some of the concerns raised throughout British Columbia with respect to the development of the salmon aquaculture industry and made a number of recommendations in their final report (May 2007, www.leg.bc.ca/CMT/38thparl/session-3/aquaculture/index.htm).

This workshop will focus on recommendations for closed containment, best practices for net cage farming, pest management, fallowing and siting. In addition, participants will examine the concept of coastal zoning and how this might be used to reduce the stress on wild stocks and coastal ecosystems.



Rules of Engagement

Purpose

These guidelines are designed to:

- create opportunities to maximize participation
- foster a safe place for dialogue
- enable vigorous differences to surface without disrespecting anyone
- promote an open and full exchange of information/ ideas
- generate an environment of shared learning

Context for Dialogue

All sessions involve three parts:

1. 15-minute case study presentations
2. 5-minute respondents to the presentations
3. Open-mic dialogue

All proceedings will be recorded to support the post-workshop report.

Guidelines

- Presenters/responders respect time by keeping to their allotted timeframe.
- Participants respect time through concise comments and questions.
- Participants identify themselves when speaking.
- Participants listen and speak with respect.
- Participants try to find a good way to say difficult things.
- Let there be humour, where we explore tough issues together, in a good way, with a spirit of learning, creating a healthy and constructive learning environment.
- If there are any questions or concerns please bring them to facilitators.

Agenda

■ 8:00 am | Registration, Asia Pacific Hall

Coffee and light refreshment

■ 8:30 am | Welcome

Facilitator: Michael Harstone, Senior Associate, Compass Resource Management, Vancouver, BC
John Reynolds, Tom Buell Leadership Chair in Salmon Conservation, Simon Fraser University, Burnaby, BC

■ 9:00 am | Alternatives to net cages—addressing the feasibility of closed containment salmon aquaculture

Questions for discussion:

- *What are the conditions for success and failure? For example, scale, economics, eco-labelling, environmental impacts and energy cost.*
- *Can closed containment systems be scaled up to large production rates?*

An update on the Middle Bay closed containment pilot project

Richard Buchanan, President, AgriMarine Ltd, Campbell River, BC

Life Cycle assessment of closed containment salmon aquaculture

Peter Tyedmers, Associate Professor, Dalhousie University, Halifax, Nova Scotia

Farming rainbow trout and sockeye salmon in fresh water on land

Larry Albright, Professor Emeritus, Biosciences, Simon Fraser University and Director, Freshwater Aquaculture Association of BC, Burnaby, BC

■ 10:00 am | Inner circle dialogue

Based on the presentations, what can we now conclude about the feasibility of closed-containment, including the question of scale?

John Nightingale, President, Vancouver Aquarium and Marine Sciences Centre, Vancouver, BC

Jay Ritchlin, Campaign Strategist, Marine Conservation, David Suzuki Foundation, Vancouver, BC

■ 10:20 am | General dialogue

■ 10:45 am | Break

■ 11:00 am | Net-cage salmon aquaculture—examples of best practices

Questions for discussion

- *Can we farm salmon and net cages in such a way that protects wild stocks and the adjacent ecosystems?*
- *What are the general principles of best practices that can be applied universally to salmon farming in BC?*
- *How can employment of best practices be economically sound and transparent?*

Case Study: The approach taken by Loch Duart Sustainable Salmon Company, Scotland

Nick Joy, Managing Director, Loch Duart Sustainable Salmon Company, Scotland

Case Study: The approach taken by Creative Salmon Company, Tofino, BC

Tim Rundle, Senior Biologist/Operations Manager, Creative Salmon Company, Tofino, BC

■ 11:30 am | **Inner circle dialogue**

Based on presentations, how should we proceed with salmon aquaculture in BC?

Robin Austin, MLA-Skeena, and Member, British Columbia Legislative Special Committee on Sustainable Aquaculture, Victoria, BC

Chief Bob Chamberlain, Kwicksutaineuk-ah-kwa-mish Band, Simoon Sound, BC

Larry Greba, Advisor, KITASOO Fisheries Program, Vancouver, BC

David Lane, Researcher, T. Buck Suzuki Environmental Foundation, Vancouver, BC

■ 12:00 noon | **Open dialogue**

■ 12:30 pm | **Lunch in the ICBC Concourse**

■ 1:30 pm | **Pest management**

Question for discussion

What are the implications of and effective alternatives to the use of chemo-therapeutants on salmon farms?

Using an integrated pest management approach for sealice control

Myron Roth, Aquaculture Analyst, Province of British Columbia

What can genomics offer?

Ben Koop, Canada Research Chair, Director, Centre for Biomedical Research, University of Victoria and co-investigator of cGRASP

New technology for pest management

Sunil Kadri, Director, Aquaculture Innovation, Glasgow, Scotland

■ 2:15 pm | **Inner circle dialogue**

What does this suggest about best practices for pest management for salmon aquaculture in BC?

Paddy Gargan, Senior Research Officer, Central Fisheries Board, Mobhi Boreen, Glasnevin, Dublin, Ireland

Simon Jones, Fish Health Research Scientist, Fisheries and Oceans Canada, Nanaimo, BC

Robert Mountain, Manager Operations, Guardian Department, Kwakiutl Territorial Fisheries Commission, Alert Bay, BC

■ 2:35 pm | **General dialogue**

■ 3:00 pm | **Break**

■ 3:15 pm | **Coastal planning for salmon farms**

Questions for discussion

- *What lessons can British Columbia learn from coastal planning processes in Europe?*
- *Which is most appropriate for BC, closed containment or net cages?*
- *What are the challenges and solutions for developing and implementing a coastal plan?*
- *What should such a plan need to consider?*

Coastal planning in Iceland

Sigudur Gudjonsson, Director, Institute of Freshwater Fisheries, Keflavic, Iceland

Coastal plan for the Two Brooms Area in Wester Ross, Scotland

Colin Wishart, Principal Officer (Coastal), Highland Council, Scotland

Implementing coastal plans in Norway:

The example of Akvavis, Hardangerfjord

Inge Doskeland, Hordaland County Council, Norway

■ 4:00 pm | **Inner circle dialogue**

What is the vision for salmon aquaculture on the British Columbian coast?

Clare Backman, Environment and Compliance Manager, Marine Harvest Canada, Campbell River, BC

Dan Lane, Professor, Telfer School of Management, University of Ottawa, Ottawa, Ontario

Rob Paynter, Manager, Marine Planning, Integrated Land Management Bureau, BC Ministry of Agriculture and Lands, Victoria, BC

■ 4:20 pm | **General dialogue**

Can we agree on a vision?

■ 5:00 pm | **Wrap up**

How do we take the vision forward?

Don Millerd, Chief Executive Officer, Batchelor Bay Management, North Vancouver, BC (to be confirmed)

Craig Orr, Executive Director, Watershed Watch Salmon Society, Coquitlam, BC

Brian Riddell, Division Head, Salmon and Freshwater, Science Branch, Fisheries and Oceans Canada, Nanaimo, BC

Rick Routledge, Statistics and Actuarial Sciences, Simon Fraser University, Burnaby, BC

Closing

John Reynolds, Tom Buell Leadership Chair in Salmon Conservation, Simon Fraser University, Burnaby, BC



Participant Biographies

■ **Larry Albright** is Professor Emeritus at Simon Fraser University after being a faculty member in Biological Sciences from 1967–2006. He is the author or coauthor of over 130 refereed papers. The ground breaking research of his Ph.D. student, Stewart Johnson, worked out the complete life cycle of the sea louse *Lepthiotherius salmonis*, and to determine the relative susceptibility of Pacific and Atlantic salmon to infections by it. Dr. Albright is also the Chair of the Freshwater Aquaculture Association of British Columbia, whose members produce in excess of 90 % of the commercial food fish of BC in freshwater. He is also co-owner of a freshwater farm in the Fraser Valley that annually produces, approximately 40 tonnes of a mixture of rainbow trout and sockeye salmon for the human foodfish markets in western Canada.

■ **Robin Austin** was elected MLA for Skeena in May 2005 and appointed Fisheries Critic for the official opposition. When the Premier created the Special Committee on Sustainable Aquaculture in the fall of 2005, Austin was made Chair of that Committee and then worked on that issue for 18 months, travelling around the Province. The Committee presented the report to the House on May 31, 2007. Austin has a BA in Business from Strathclyde University in Scotland as well as a B.S.W. from the University of Northern BC. He lives in Terrace.

■ **David Clare Backman** is the Director of Community Relations and Environmental Compliance at Marine Harvest Canada. Building on the foundations of field research, habitat rehabilitation and hatchery culture, the focus of his career has been on salmon, both wild and farmed. For the past twenty years he has turned his attention to salmon culture with a building emphasis on sustainability; economic, social and environmental. Within Marine Harvest, Backman actively supports research into ecological issues of salmon farming. He has represented Marine Harvest in the World Wildlife fund's Salmon Aquaculture Dialogue and is engaged with several local ENGOs through the Marine Harvest Canada/Canadian Alliance for Aquaculture Reform (MHC/CARR) Framework for Dialogue. He earned a BSc. (Mar Biol.) from UBC in 1981; is a registered professional biologist and has worked with the provincial and federal governments.

■ **Richard Buchanan**, P.Eng., an executive entrepreneur in the BC aquaculture industry since its inception in the early 1980s; was engaged initially in fishery consulting and then as a developer/operator of salmon hatcheries, salmon farms and salmon processing plant. He established Envirocon Pacific Ltd. in 1971, a private environmental and fisheries consulting company, which evolved into AgriMarine Industries Inc. a BC company presently engaged in closed containment salmon farming research and development of a commercial demonstration farm at Middle Bay in Campbell River. As President of AgriMarine, he directed the firm into research and development of a land based closed containment rearing facility at Cedar BC; producing Pacific salmon marketed through Thrifty Foods, as Ecosalmon. Buchanan is a past President and Treasurer of the Vancouver Aquarium and Marine Science Center and served on the Board of Governors for over 22 years. He is currently a Patron and a Board Member of the Vancouver Aquarium's Marine Science Foundation.

■ **Bob Chamberlin** is the elected chief of the Kwicksutaiuneuk Ah-kwa-mish First Nation of Gilford Island, and Wakeman Sound respectively. The traditional territories of his First Nation encompass the Broughton Archipelago, which of course has been the focus of much attention in regards to Open Net Cage Finfish Aquaculture. In his role as Chief Chamberlin has become very knowledgeable in regards to the known impacts within the traditional territories of his First Nation. Not simply the impacts of the Sea Lice on wild salmon, but also has been seeing the cumulative far field impacts of the Aquaculture Industry. He has also travelled to Norway in attempts to have the major Fish farm companies hear his concerns for the territory and to raise the issues at the international stage.

■ **Inge Døskeland** is head of the coastal affairs section in Hordaland County Council responsible for marine regional development since 2004. He obtained his B.Sc. degree in Biology-Chemistry (1990), and "storfag" in Geography (1993), from the University of Bergen. In 1994 he was a coastal zone planner in the municipality of Radøy developing their first generation coastal zone plan. In 1995 he was an environmental adviser in the municipality of Bremanger, and in 1996 a regional coastal zone planner and developer of geographic information systems in the county of Sogn/Fjordane. From 1997 to 2003, in Hordaland county administration, he was responsible for the counties first integrated coastal zone plan, he was the lead partner for the EU Interreg project "Seagis" and was responsible for implementing GIS. In 2004 he worked for the Norwegian Institute Water Research (NIVA).

■ **Paddy Gargan** is the Senior Research Officer with the Central Fisheries Board, at the Swords Business Campus, Swords, Co. Dublin. The Central Fisheries Board has responsibility for the management, development, protection and research of salmon and sea trout stocks. The Board has been concerned regarding the potential impact of sea lice from marine salmon farms on wild salmonid stocks. Gargan has been involved in research into the impact of sea lice from marine salmon aquaculture on sea trout stocks on Ireland's west coast since 1990. In more recent years he has undertaken the Irish research on the impact of sea lice on migrating salmon smolts as part of a European Union funded SUMBAWS programme. He sits on a number of national committees relating to the licencing, regulation and management of both salmon aquaculture and wild salmonid fisheries.

■ **Larry Greba** has extensive experience and training in the field of fisheries. He has worked with twenty-five First Nations communities throughout British Columbia over the past twenty-three years primarily in fisheries enhancement, management and shellfish and finfish aquaculture. He has worked closely with the Kitasoo/Xaixais, OKNTC, Tsimshian Treaty Society and the Turning Point Initiative, and has represented the interests of many of these organizations on a myriad of boards and committees. He also serves as a director for several Kitasoo Band businesses.

■ **Sigurdur Gudjonsson** has been working at the Institute of Freshwater Fisheries in Iceland first as a scientist and since 1997 as the director. The Institute's role is to do research and development regarding freshwater fisheries and aquaculture. The Institute is governmental and works closely with the authorities, i.e. the Directorate of Freshwater Fisheries (now the Agricultural Authority) and the ministries regarding management of the resources. Gudjonsson's work has mainly been with Atlantic salmon studying life history strategies and river classification as well as salmon population genetics and in later years focused on fisheries management and management of the freshwater fish resources. The interaction of aquaculture and wild salmonids has taken much time and effort to find solutions in order that these can co-exist. His latest research work involves using DST tagged smolts to map the routes of salmon at sea.

■ **Michael Harstone** is a partner with Compass Resource Management Ltd. He is a decision analyst and facilitator with ten years experience assisting First Nations, community groups, and government agencies on complex resource management issues. He has extensive knowledge in the water, energy, wildlife, and fisheries sectors. Compass is a local management consulting firm dedicated to improving both the quality of policy and management decisions and the decision-making capacity of citizens, corporations, governments and community organizations. The cornerstone of their approach is a commitment to providing balanced analysis and facilitating

meaningful dialogue. Their goal is to produce transparent and accountable decisions based on a good understanding of science, values, uncertainty and trade-offs.

■ **Simon Jones** is a research scientist in the Aquatic Animal Health Section at the Pacific Biological Station in Nanaimo. He is also an adjunct professor in the Biology Department at the University of Victoria. His research focus is on fish parasitology with an emphasis on the defence mechanisms that fish use to resist infection with parasites. He has been investigating the occurrence and impacts of parasites in wild fish for over twenty years. For the last four years, in collaboration with Norwegian and Scottish scientists, he has focused on sea lice interactions between wild and farmed salmon in BC.

■ **Nick Joy** is Managing Director of a small independent Scottish salmon farming company, Loch Duart Ltd. Based in Sutherland in the very North West of Scotland, Loch Duart is noted for its ethical approach to salmon farming which has earned the company top end customers in Europe and beyond. Joy has over 25 years experience in the Scottish salmon farming industry. He has always worked in the independent sector of the industry and vigorously promotes Loch Duart's approach to sustainable farming. Under Joy's stewardship, the company has successfully implemented ground-breaking initiatives in fish welfare, site following, water quality and fishmeal sustainability. Loch Duart was the first salmon farm in the world to achieve Freedom Food approval and was the national winner in its category of the VIBES Award (Vision in Business for the Environment of Scotland) in 2005. Gold Award winner of 'Best Food' in The Daily Telegraph 'Taste of Britain' Awards, Loch Duart is currently the subject of considerable media interest in integrated aquaculture — farmed indigenous sea urchins and seaweed, grown alongside the salmon, are being brought to the market in 2007.

■ **Sunil Kadri** has spent more than twenty years working in aquaculture within the fields of research, development and the industry itself. Within industry, Kadri has for the past decade been involved in the successful business development of novel technologies which have contributed to improvements in production, environmental impact and fish welfare; furthering sustainability of intensive aquaculture. His academic pursuits have included behavioural studies of salmon, trout, sea bream and sea bass; and present projects involve cod and carp. He has also recently been working with philosophers and social anthropologists in both Europe and North America, providing a fresh perspective on the social, moral and regulatory context into which aquaculture research and industry practices must fit. He holds an Honorary Research Fellowship at University of Glasgow and operates a consultancy business: Aquaculture Innovation. His active involvement in both industry and academia provides for two way knowledge transfer which has been a very important aspect of his career.

Speaking for the Salmon



■ **Ben Koop** is a molecular evolutionary biologist with interests in immunology, cancer, population genetics and genomics. He is a professor and Canada Research Chair in the departments of Biology and Medical Sciences at the University of Victoria. He co-directs the consortium for Genomic Research on All Salmon Project (cGRASP) and his research has resulted in the identification of most of the genes in salmon and the production of a widely used 16,000 gene chip.

■ **Daniel Lane** is a Professor at the Telfer School of Management at the University of Ottawa. Professor Lane concentrates his research interests on decision-making processes, simulation modelling and control of dynamic systems, especially in the area of natural resource management and commercial fishing and aquaculture. He is currently involved in ongoing research on fisheries management and aquaculture decision-making strategies, and strategic planning in Atlantic Canada and internationally. He is a recipient of numerous research grants that include the Natural Sciences and Engineering Research Council (NSERC) of Canada Individual Operating and Discovery Grants (since 1986), SSRHCC (Team grants), National Research Council-Department of Fisheries and Oceans Science Subvention (2003), Health Canada (2004), Network Investigator to the National Centre of Excellence on Aquaculture, AquaNet (2004-2005), and Principal Investigator and Chair of the Oceans Management Research Network (OMRN, since 2005), a Joint Initiative Program of the Department of Fisheries and Oceans and the Social Science and Humanities Research Council of Canada (SSHRC). He was a member of working groups on stock assessment and fisheries management plans for the Department of Fisheries and Oceans. From 1998 to 2003 he was appointed by the Minister of Fisheries and Oceans to the Fisheries Resource Conservation Council (FRCC) where he has acted as Chair of the Scotia-Fundy Ecosystem Team, and Chair of the Gulf of St. Lawrence Ecosystem Team. In 2002 he was appointed by the Minister of Foreign Affairs and International Trade as a member of the Fish and Sea Products Sectoral Advisory Groups on International Trade (SAGIT). He was also appointed by the Minister of the Environment to the Species at Risk (SAR) Shareholders' Advisory Committee (since Spring 2004).

■ **David Lane** is the Executive Director of the T. Buck Suzuki Environmental Foundation. He has a long history of working on environmental issues relating to fish habitat protection ranging from salmon farming, poor logging practices, pulp mill pollution, hydroelectric developments, sewage and industrial pollution. The T. Buck Suzuki Foundation is a founding member of the Coastal Alliance for Aquaculture Reform (CAAR) and has been involved in the salmon farming issue since the mid-1980s. David Lane served as an environmental representative on the Salmon Aquaculture Implementation Advisory Committee and the BC Aquaculture Research and Development Committee.

■ **Robert Mountain** is the Manager of Operations in the Guardian Department of the Kwakiutl Territorial Fisheries Commission in Alert Bay, BC.

■ **John Nightingale** has a broad professional background in aquatic sciences specializing in their use to enhance public awareness, education and conservation. His experience ranges from curating living animal collections to developing strategic and physical plans for both new and existing aquariums and museums. A professional biologist and public educator, Dr. Nightingale has been responsible for the development and operation of some of the best animal care systems in use in a variety of aquariums. His background and lifelong work in public communications, and both formal and informal public education, make him a leader in the current rapid development of new conservation efforts in aquariums, zoos and museums. During his fourteen years at the Vancouver Aquarium, he has guided the expansion of the Aquarium's leadership in conservation and research while focusing operations on sustainability and solid fiscal performance. As a result, the Vancouver Aquarium is not only one of the "greenest" cultural institutions in Canada, it is the only one that is financially self-sufficient, operating without an annual subsidy from the Government. Dr. Nightingale has also helped lead and manage the development of new institutions such as the Oregon Coast Aquarium, the Maui Ocean Center and Shark Reef at Mandalay Bay, as well as existing ones such as the New York Aquarium and the Seattle Aquarium.

■ **Craig Orr** is a behavioural ecologist, salmon conservationist, and the executive director of Watershed Watch Salmon Society. Craig specializes in science outreach and since 1998 has helped Simon Fraser University organize more than two dozen workshops for the Speaking for the Salmon series. He has also published popular and scientific papers on sea lice and ecosystemic effects of salmon farms, and currently leads the Coastal Alliance for Aquaculture Reform's collaborative sea lice monitoring and research efforts with Marine Harvest Canada.

■ **Rob Paynter** is the Manager, Marine Planning with Integrated Land Management Bureau at the BC Ministry of Agriculture and Lands.

■ **John Reynolds** joined SFU in 2005, taking up the Tom Buell BC Leadership Chair in Salmon Conservation. He is on the Science Advisory Committee of the Pacific Salmon Forum, which was established by the BC Premier to investigate interactions between wild and farmed salmon. His research includes co-supervision of an MSc student working in the Broughton on interactions between sea lice, sticklebacks, and juvenile wild salmon.

■ **Brian Riddell** is Division Head of Salmon and Freshwater Ecosystems in the Science Branch of Fisheries and Oceans Canada based at the Pacific Biological Station in Nanaimo. His research interests include population biology and genetics (quantitative and population) of Pacific salmonids; population dynamics, life history, and fishing mortality estimates for Pacific salmon, in particular chinook salmon; appropriate management policy for Pacific salmonids; and formulation of science-based policy for conservation and utilization of Pacific salmon. During 2002-04, as Science Advisor to the Pacific Fisheries Resource Conservation Council (PFRCC), Riddell authored or co-authored reports on the Broughton Archipelago Pink Salmon advisory, the PFRCC Aquaculture advisory, Stock Assessment for Central and Northern BC, a technical review of over-escapement, and an Advisory on a proposed Aquaculture Forum for BC. Dr. Riddell was also one of the primary authors of Canada's Policy for Conservation of Wild Pacific Salmon.

■ **Jay Ritchlin** is the Campaign Strategist of Marine Conservation at the David Suzuki foundation.

■ **Myron Roth** has a B.Sc. in Zoology from UBC and a Ph.D. from the Institute of Aquaculture, University of Stirling, Scotland, where he studied sea lice control. Myron has over twenty years as a fish biologist specialising in fish health management, aquaculture biotechnology and regulatory affairs. Roth has published numerous scientific publications, technical papers and popular articles on fish chemotherapy, parasitology and marine biology. He is currently an Aquaculture Analyst with the Aquaculture Development Branch of the BC Ministry of Agriculture and Lands.

■ **Rick Routledge**, Professor and Former Chair, Statistics and Actuarial Sciences at SFU, has been collaborating with Alexandra Morton, Marty Krkosek and others on sea lice research in British Columbia. This highly controversial work has provided evidence that sea lice infestations on salmon farms spread to passing juvenile pink and chum salmon, and that lice loads commonly observed on these notably small wild fish close to the farms can cause a substantial increase in short-term mortality. Routledge has also been studying the juvenile migration of a severely depleted sockeye salmon population on the British Columbia Central Coast. Evidence available to date points to changes to early-spring river flows as a major contributing factor to the decline—changes which are likely linked in turn to increasing atmospheric carbon dioxide concentrations.

■ **Tim Rundle** is the Senior Biologist/Operations Manager with Creative Salmon Company Ltd. Creative Salmon established in 1990 is one of only a few premium growers of Chinook salmon in Canada and the world. Creative Salmon is based out of Tofino and operates in the traditional territory of the Tla-o-qui-aht First Nations in Clayoquot Sound. With a team of 47 full time employees, Creative Salmon is at the forefront of the industry for its environmental practices and high quality standards.

■ **Peter Tyedmers** is an ecological economist whose research explores the biophysical sustainability of food production systems and the impact of technological substitution. He earned his Ph.D. in the Resource Management and Environmental Studies program at the University of British Columbia in 2000. Prior to undertaking his doctorate, Peter received a B.Sc. in Earth Science (University of Waterloo) and an LL.B. (University of British Columbia). Ongoing research activities use energy analysis and life cycle assessment to evaluate the performance of a wide range of capture fisheries, aquaculture and livestock production systems. Peter is appointed as an Associate Professor in the School for Resource and Environmental Studies at Dalhousie University in Halifax, Nova Scotia.

■ **Colin Wishart** is Principal Coastal Officer with the Highland Council, based in Inverness, Scotland. He has more than fifteen years experience of dealing with planning issues associated with salmon farming. Wishart takes a keen interest in natural resources generally and has helped to pioneer new methodologies for both forestry and coastal zone planning in his home country. He currently represents the Scottish local authorities on a number of national working groups which are concerned with aquaculture, coastal zone management, and the development of marine spatial planning. He has also worked on international partnership projects funded by the EU. When he's not in the office or at home you'll usually find he's away diving in one of the sea lochs on the West Coast or ranging over his local Highland hills.

